

## SYNOPSIS OF THE GENUS *LEDEBOURIA* ROTH (HYACINTHACEAE) IN SOUTH AFRICA

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### INTRODUCTION

The genus *Ledebouria* Roth belongs to the family Hyacinthaceae (Dahlgren et al. 1985). The distribution of the genus includes the African Continent, India and the Island Nossi-Bé on the northwestern coast of Madagascar (Fig. 1). The centre of diversity for the genus is in the Limpopo, Mpumalanga and KwaZulu/Natal Provinces of the Republic of South Africa.

Roth described the genus *Ledebouria* in 1821 with *Ledebouria hyacinthina* Roth, from India, as the type species. This species was transferred to the genus *Scilla* L. and provided the basionym for the largest section of *Scilla* namely section *Ledebouria* (Baker, 1870). Later Jessop (1970) reinstated the genus *Ledebouria* whilst revising the genus for South Africa. The first revision of *Ledebouria* was by Baker (1870) in his monograph of *Scilla*, section *Ledebouria* and the genus *Drimiopsis*. This was followed by a revision of the herbaceous capsular gamophyllous Liliaceae (Baker, 1870a). The most recent revision of *Ledebouria* was by Venter (1993), again only for South Africa with some notes on species further to the north.

The large degree of phenotypic variation in *Ledebouria*, particularly with regard to habit and leaf maculation, has resulted in the publication of 102 species in four different genera. This led to numerous combinations and changes throughout the taxonomic history of the genus. As a result the species concepts were a source of considerable nomenclatural and taxonomic confusion.

Manning et al. (2004) revised the sub-Saharan Hyacinthaceae based on a molecular phylogenetic analysis and based on this study, the *Drimiopsis* Lindl. & Paxton, *Resnova* Van der Merwe and *Ledebouria* clade forms a polytomy in the strict consensus tree and is not further resolved providing no support for more than a single genus. The morphological characters used by Manning et al. (2004) as support for this clade are homoplasious or symple-

siomorphies (Lebatha et al. 2006) and can hardly be used for including *Drimiopsis* and *Resnova* into *Ledebouria*. These morphological characters are the following 1) Lack of bracteoles – at least 22 species of *Ledebouria* have bracteoles. 2) Globose or top-shaped ovary – six species of *Ledebouria* have ellipsoidal ovaries and *Ledebouria ovatifolia* has a distinct cylindrical ovary. 3) Most species have spotted leaves – in *Ledebouria* alone there are 11 species having only concolorous leaves and nine species where the leaves can either be concolorous or spotted, even in the same population. 4) They often produce more than a single inflorescence per plant in one growing season – in *Ledebouria* alone there are 10 species producing only a single inflorescence. 5) The bulb scales are often rather loosely packed – only six species of *Ledebouria* have bulb scales that are somewhat loosely arranged, the rest have tightly packed bulb scales. 6) Bulb scales producing threads when torn – there are more *Ledebouria* species lacking threads when bulb scales are torn. A wider range and more material need to be analyzed to give a more realistic picture of the phylogenetic history of *Ledebouria*.

#### SPECIES TREATMENT

##### *Ledebouria* Roth

Nov. Pl. Sp.:194 (1821); J.P. Jessop, Journ. S. Afr. Bot. 36 (4):244 (1970); Dyer, Gen. S. Afr. Fl. Plants 2:937 (1983), Manning et al. Edinburgh Journ. of Botany 60(3): 533–568 (2004), Lebatha et al., Taxon 53(3):643-652 (2006).

*Eratobotrys* Fenzl ex Endl., Gen. Pl., Suppl. 2:13 (1842).

*Xeodolon* Salisb., Gen. Pl.:18 (1866).

*Scilla* L. pro parte Baker, Flora Cap. 6:478 (1896); Phillips, Gen. S. Afr. Fl. Plants:191 (1951).

Type species: *Ledebouria hyacinthina* Roth (= *Scilla indica* Baker), from India, Curtis's Bot. Mag. 60:t.3226 (1833).

Plants deciduous or evergreen, solitary to gregarious; roots wiry, contractile, fleshy or fusiform; *bulb* usually subterranean, sometimes epigeal, globose to cylindrical, 10–200 mm diameter, sometimes forming a prominent neck, tunicated or with more or less loosely imbricate scales, scales yellowish brown to purple, sometimes with threads when torn, basal stem occasionally present, 0–120 mm long, *cataphylls* 0–3. *Leaves* 1–20, partly or fully devel-

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oped at flowering, erect to depressed, sometimes spirally twisted, linear to suborbicular, fleshy or leathery, glabrous to pubescent, green to purple with or without darker green or purple markings. *Inflorescences* 1–10, in succession, each a few to many-flowered raceme, sometimes subspicate, 4–150-flowered; *peduncle* erect or flaccid, smooth or papillate, sometimes marked; *bracts* either small and membranous or fleshy, vestigial or lacking, with or without bracteoles. *Raceme* lax or dense, cylindric to globose; pedicels sometimes vestigial, spreading, 1.0–15.5 mm long. *Flowers* usually nodding, green, purple to pink, rotate to campanulate or subglobose; tepals usually more or less erect below and recurved above, mostly fused at base, linear to oblong, usually dimorphic with inner tepals cucullate and connivent; *stamens* exerted or included, usually free, the outer inserted at base of tepals, the inner higher up, sometimes shorter than the outer, erect or spreading; filaments white, green, pink to purple, base cylindric to slightly flattened; anthers white, yellow or violet, dorsifixed; *ovary* ovoid or turbinate and then 3–6-lobed with a short carpophore, lobes variously shaped, often with swollen, nectar-producing lobules below; ovules (1-)2 per locule; *style* triangular to terete; stigma penicillate. *Capsule* globose to obovoid or clavate, 3-lobed; *seeds* 2 per locule, globose, drop-shaped or disc-shaped, black or brown, testa tightly adhering.

**Distribution:** Sixty plus species in sub-Saharan Africa, with one or two species each in India and Madagascar. The greatest species diversity occurs in the eastern and central parts of the Limpopo Province and Mpumalanga with 8–14 species per degree square (Edwards & Leistner, 1971). The areas in South Africa with the lowest diversity (1-3 species per degree square) are the Karoo, Namaqualand, Northern Cape Provinces and the Kalahari.

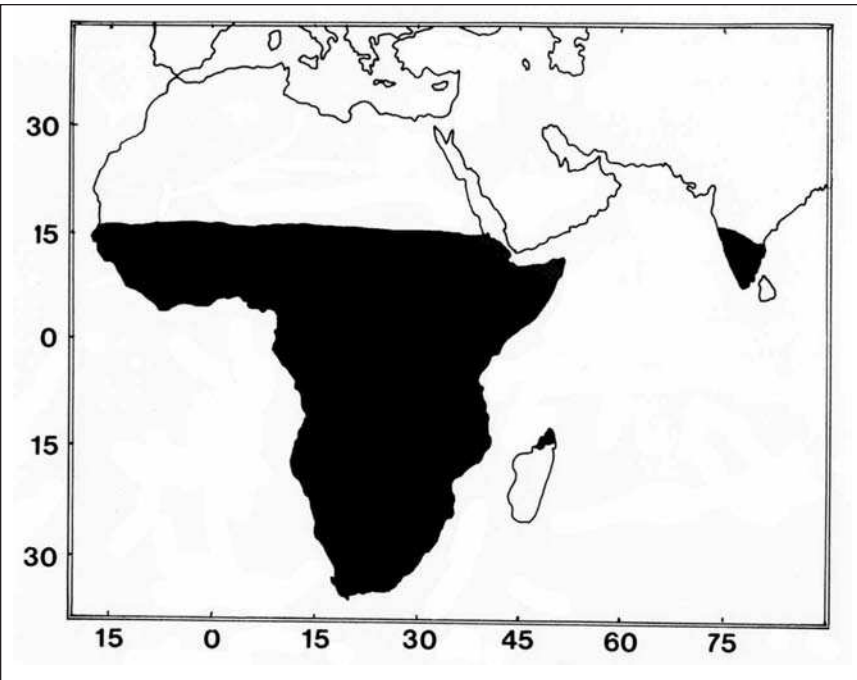


Fig. 1. Distribution of the genus *Ledebouria*.

Key to the species.

1. Bulb epigeal or semi-epigeal (more than 40% above ground) .....2.  
    Bulb hypogeal .....8.
2. Bulb epigeal .....3.  
    Bulb semi-epigeal .....4.
3. Inflorescence erect; bracts fleshy; apex of ovary not forming shoulders;  
    seed black; Eastern Cape .....35. *L. socialis*  
    Inflorescence flaccid; bracts membranous; ovary shoulders present; seed  
    brown; Limpopo Province .....10. *L. dolomiticola*
4. Inflorescence erect; leaves up to 5 mm wide; ovary shoulders tapering  
    into the style; basal part of leaf with crisped margins .....8. *L. crista*  
    Inflorescence flaccid; leaves more than 15 mm wide; ovary shoulders not  
    tapering into the style; basal part of leaf sometimes undulate .....5.
5. Bulbs cylindrical; flower bracts form a distinct coma in young  
    inflorescence .....9. *L. cremnophila*  
    Bulbs globose to ovoid; flower bracts not forming a distinct coma in the  
    young inflorescence .....6.

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6. Dead bulb scales thin, papery with indistinct abscission layers .....36. *L. venteri*  
 Dead bulb scales dry and firm with distinctly ridged transverse abscission layers .....7.
7. Leaves fully emerged at anthesis, without threads when torn, glossy green; rachis terete, smooth; bracts vestigial .....4. *L. concolor*  
 Leaves partly emerged at anthesis; with threads when torn, dull glaucous; rachis flattened at base, ridged; bracts membranous, 0.5-1.0 mm long .....5. *L. confusa*
8. Inflorescence erect .....9.  
 Inflorescence flaccid .....16.
9. Ovary 3-lobed .....10.  
 Ovary 6-lobed .....12.
10. Bulb scales truncate, with threads when torn; leaf 1 (-2), margin discoloured; rachis ridged; base of peduncle compressed; Limpopo Province and Mpumalanga .....24. *L. monophylla*  
 Bulb scales attenuate; without threads when torn; leaves 2 or more, margin concolorous; rachis smooth; base of peduncle terete .....11.
11. Adaxial leaf surface smooth; leaves without threads when torn; margin smooth; bulb ovoid, bulblets absent; Western and Eastern Cape .....25. *L. ovalifolia*  
 Adaxial leaf surface hairy; leaves with threads when torn, margin ciliate; bulb obovoid, bulblets present; Limpopo Province and Mpumalanga . .29. *L. parvifolia*
12. Petiole present .....27. *L. papillata*  
 Petiole absent .....13.
13. Bulb scales with threads when torn .....14.  
 Bulb scales without threads when torn .....16.
14. Adaxial leaf surface hairy; leaves without threads when torn, margins concolorous, fleshy; seed black; NW Province .....17. *L. lepida*  
 Adaxial leaf surface smooth; leaves with threads when torn, margin discoloured, leathery; seed brown; widespread .....15.
15. Rachis smooth; bracts fleshy; bulb scales attenuate; apex of ovary with rounded shoulders; Eastern Cape Province .....7. *L. coriacea*  
 Rachis ridged; bracts membranous; bulb scales truncate; ovary shoulders absent; Northern Cape, NW Province and Limpopo Province .....14. *L. glauca*
16. Rachis smooth; inflorescence longer than leaves; tepals not cucullate . . .17.  
 Rachis ridged; inflorescence shorter than leaves; tepals cucullate . . .21.
17. Adaxial leaf surface viscid .....38. *L. viscosa*  
 Adaxial leaf surface not viscid .....18.

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18. Basal stem well developed; leaf surface with conspicuous red pits; perianth stellate .....23. *L. mokobulanensis*  
 Basal stem absent; leaf surface lacking pits; perianth with recurved tepals . . . .19.
19. Bulb with a prominent neck; adaxial surface glabrous with large prominent purple blotches .....28. *L. pardalota*  
 Bulb without a neck; adaxial surface green or sometimes with dull purple blotches .....20.
20. Adaxial leaf surface covered in broad papillae up to 0.5-1.0 mm high; leaves 40-60(-90) mm wide; inflorescence 30-70-flowered; rachis ridged .....30. *L. pustulata*  
 Adaxial leaf surface smooth; leaves 18-30 mm wide; inflorescence 12-20-flowered; rachis smooth .....34. *L. sandersonii*
21. Leaves absent at anthesis .....37. *L. undulata*  
 Leaves present at anthesis .....22.
22. Petiole present; Mpumalanga Province .....23.  
 Petiole absent; not restricted to Mpumalanga .....24.
23. Rachis smooth; adaxial leaf surface hairy, without threads when torn; seed brown .....33. *L. rupestris*  
 Rachis ridged; adaxial leaf surface smooth, with threads when torn; seed yellowish-brown .....31. *L. remifolia*
24. Ovary 3-lobed .....25.  
 Ovary 6-lobed .....26.
25. Bulb scales truncate, with threads when torn; adaxial leaf surface with lacunae; rachis ridged; ovary shoulders absent; Kaapsche Hoop area .....13. *L. galpinii*  
 Bulb scales attenuate, without threads when torn; adaxial leaf surface smooth; rachis smooth; ovary shoulders rounded; Eastern and Western Cape .....25. *L. ovalifolia*
26. Bulb scales with threads when torn .....27.  
 Bulb scales without threads when torn .....35.
27. Leaves spirally twisted .....28.  
 Leaves straight .....29.
28. Ovary shoulders present; bulb obovoid; leaves leathery, difficult to tear, margin discolorous; widespread .....21. *L. marginata*  
 Ovary shoulders absent; bulb cylindrical; leaves fleshy, easily torn, margin concolorous; NW Province .....3. *L. atrobrunnea*

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29. Leaves hairy, margin ciliate; bracts fleshy; tepals lanceolate;  
 Eastern Cape .....15. *L. hypoxidioides*  
 Leaves glabrous, margin smooth; bracts membranous; tepals oblong;  
 widespread .....30.
30. Leaves partly emerged at anthesis .....31.  
 Leaves fully developed at anthesis .....32.
31. Bulb scales truncate; live bulb scales loosely arranged; leaves glossy,  
 abaxial surface monochromatic, base canaliculated ....26. *L. ovatifolia*  
 Bulb scales attenuate; live bulb scales tightly arranged; leaves lusterless,  
 abaxial surface dichromatic, base flat .....35.
32. Ovary shoulders present; bulb ovoid, 30-35 mm diameter; bulb scales with promi-  
 nent purple blotches; leaf margin discolorous; seed brown .....16. *L. inquinata*  
 Ovary shoulders absent; bulb obovoid, 100-150 mm diameter; bulb scales  
 without purple blotches; leaf margin concolorous; seed black .....33.
33. Seed black; tepals not cucullate; pedicels green; perianth predominantly  
 green .....39. *L. zebrina*  
 Seed brown; tepals cucullate; pedicels pink; perianth pink to purple ....34.
34. Leaves fleshy, glossy, margin concolorous, venation obscure ...32. *L. revoluta*  
 Leaves leathery, lusterless, margin discolorous, venation prominent ..19. *L. luteola*
35. Leaves with threads when torn; rachis ridged .....36.  
 Leaves without threads when torn; rachis smooth .....38.
36. Leaves spirally twisted, partly emerged at anthesis, margin concolorous;  
 tepals linear; seed black .....18. *L. leptophylla*  
 Leaves straight, fully developed at anthesis, margin discolorous; tepals  
 oblong; seed brown .....37.
37. Ovary shoulders tapering into the style; bulb ovoid; leaf margin smooth;  
 venation obscure .....12. *L. floribunda*  
 Ovary shoulders raised; bulb subglobose; leaf margin papillate; venation  
 prominent .....2. *L. asperifolia*
38. Bracts fleshy .....39.  
 Bracts membranous .....43.
39. Ovary shoulders present, base of ovary lobes smooth .....40.  
 Ovary shoulders absent, base of ovary lobes papillate .....42.
40. Ovary shoulders truncate; leaf apex obtuse, venation prominent; peri-  
 anth stellate .....20. *L. macowanii*  
 Ovary shoulders tapering into the style; leaf apex acute, venation  
 obscure; perianth recurved .....41.

41. Live bulb scales loosely arranged; dead bulb scales brown; abaxial leaf surface monochromatic; inflorescence longer than leaves .....34. *L. sandersonii*  
 Live bulb scales tightly arranged; dead bulb scales purplish-brown; abaxial leaf surface dichromatic; inflorescence same length as leaves .....1. *L. apertiflora*
42. Leaves linear to narrowly elliptic; perianth stellate .....22. *L. minima*  
 Leaves lanceolate to oblong; perianth sharply reflexed .....11. *L. ensifolia*
43. Ovary shoulders present; bulb obovoid, live bulb scales tightly arranged, bulblets absent; leaves elliptic .....1. *L. apertiflora*  
 Ovary shoulders absent; bulb subglobose, live bulb scales loose, bulblets present; leaves lanceolate .....6. *L. cooperi*

1. *Ledebouria apertiflora* (Baker) Jessop, Journ. S. Afr. Bot. 36(4):254 (1970).

Type: Figure in Saund. Ref. Bot. 1:t.19 (1868), lecto,!. here designated.

*Drimia apertiflora* Baker, Saund. Ref. Bot. 1:t.19 (1868).

*Scilla lorata* Baker, Saund. Ref. Bot. 3 (Append.):14 (1870). Iconotype: As for *Drimia apertiflora*.

*Scilla linearifolia* Baker, Saund. Ref. Bot. 3: t.184 (1870). Iconotype: Saund. Ref. Bot. 3:t.184 (1870).

*Scilla apertiflora* (Baker) C.A. Sm., Kew Bull. : 250 (1930). Type: As for *Drimia apertiflora*.

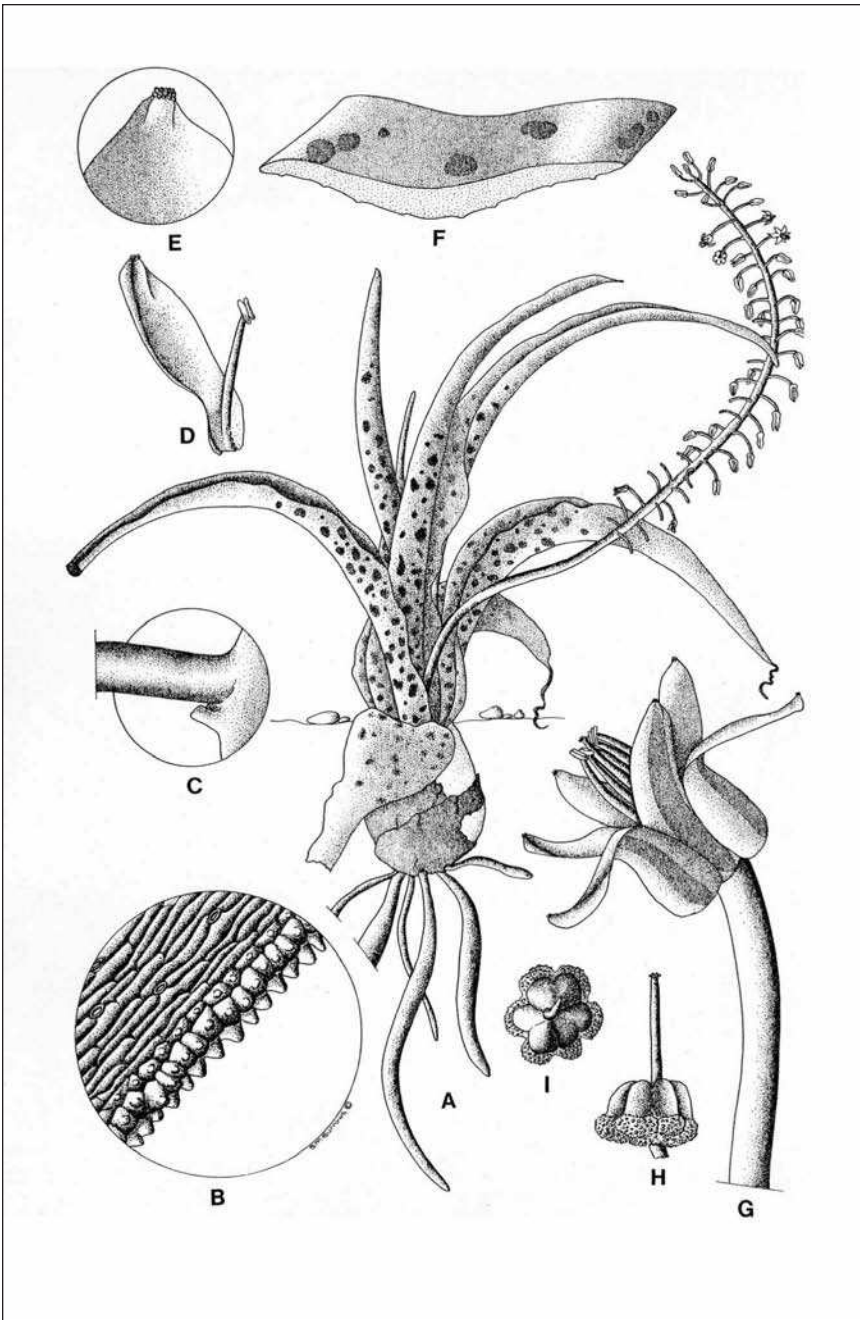
**Diagnostic Features:**

Live bulb scales tightly arranged, dead bulb scales purplish-brown, leaves without threads when torn, abaxial lamina surface dichromatic, inflorescences equaling to longer than leaves, rachis and scape smooth and the apex of the ovary tapering into the style.

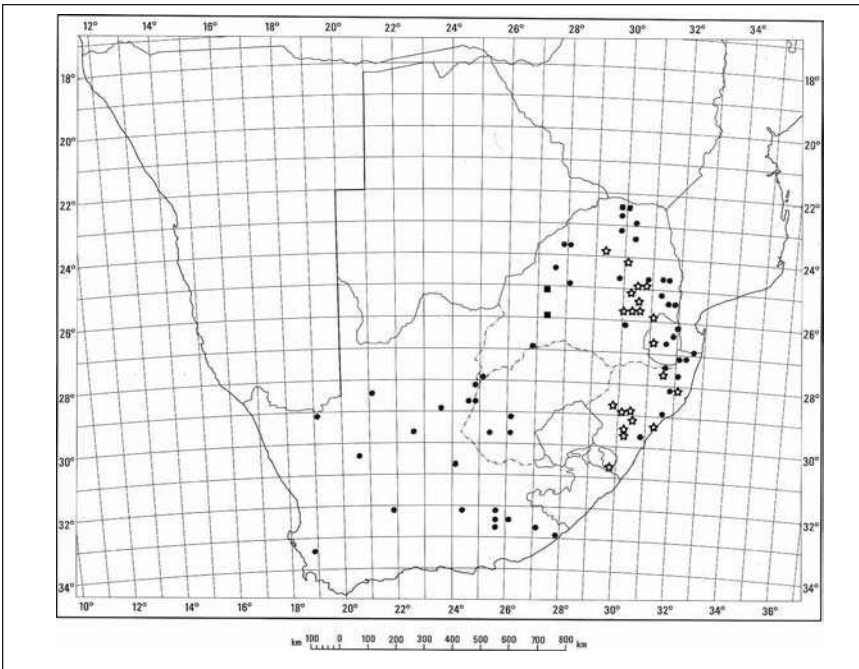
**Discussion:**

*Ledebouria apertiflora* differs from *L. cooperi* (Hook. f.) Jessop in the absence of bulblets and bracteoles; acute tepal apices, style 1.5 mm long and the ovary 1.2 mm wide. *L. revoluta* (L. f.) Jessop differs in having threads in the leaves and bulb scales when torn, its ridged rachis, wider tepals ( $\pm 3$  mm) with obtuse apices, longer style (6 mm) and ellipsoidal ovary. Erroneously included in *L. ensifolia* (Ecklon) S. Venter & Edwards (2003).



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**Fig. 2. *Ledebouria apertiflora*.** **A**, flowering plant ( $\times 0.5$ ); **B**, leaf margin ( $\times 300$ ); **C**, bract ( $\times 10$ ); **D**, tepal with stamen ( $\times 10$ ); **E**, apex of tepal ( $\times 25$ ); **F**, cross-section through leaf ( $\times 5$ ); **G**, flower ( $\times 10$ ); **H**, gynoecium lateral view ( $\times 10$ ); **I**, gynoecium dorsal view ( $\times 10$ ). Drawn from Venter *s.n.* (UNIN).



**Fig. 3.** Known distribution of *Ledebouria apertiflora* (solid circles), *L. asperifolia* (stars) and *L. atrobrunnea* (filled squares).

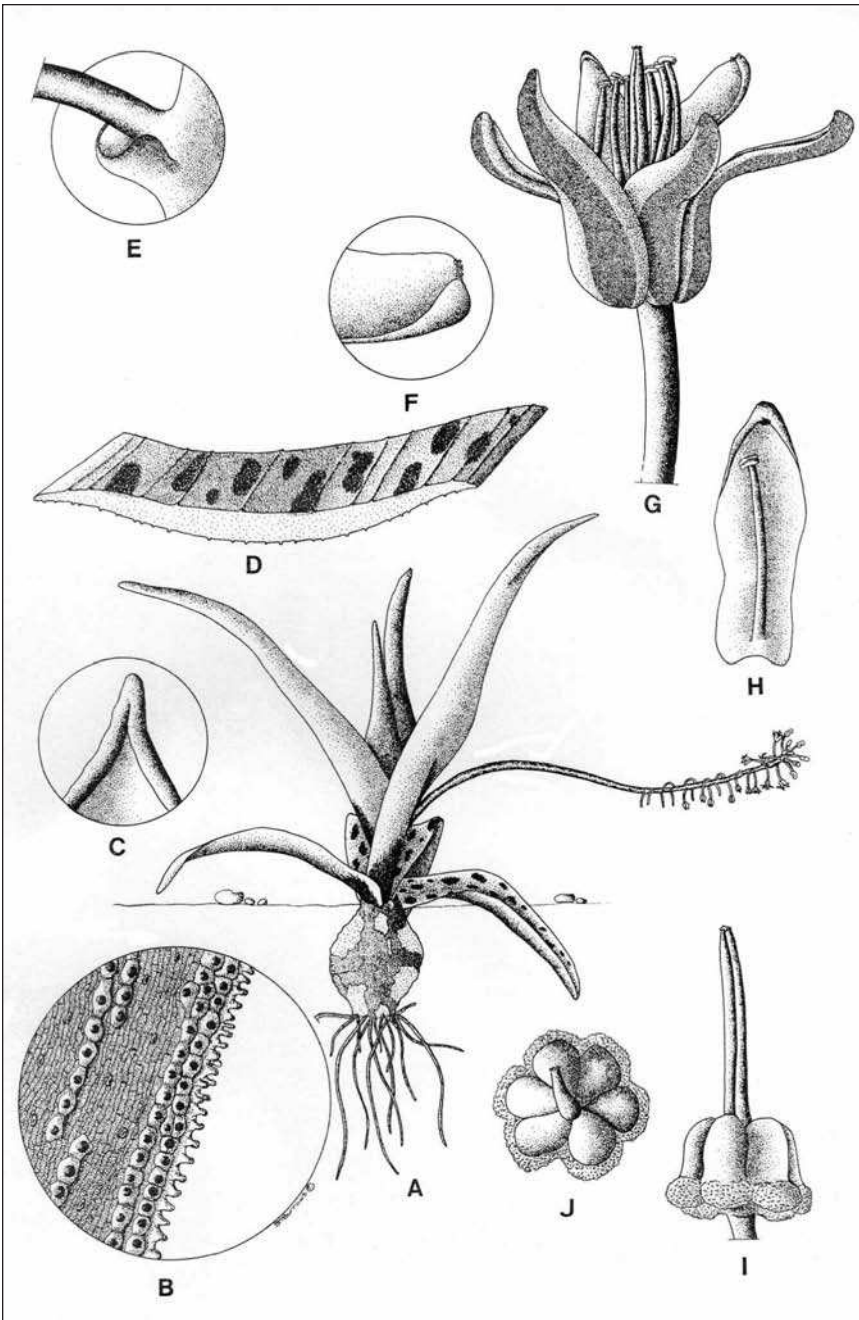
2. *Ledebouria asperifolia* (Van der Merwe) S. Venter comb. nov., Type: South Africa. Natal, hillsides at Ladysmith, Van der Merwe 2604 (PRE!, holo.; iso. NU!).  
*Scilla asperifolia* Van der Merwe in Fl. Pl. S. Afr. 24: t.944 (1944).

**Diagnostic Features:**

Purplish-brown dead bulb scales, leaves fully developed at anthesis, leaves and scape covered in tongue-shaped asperities and bracteoles absent.

**Discussion:**

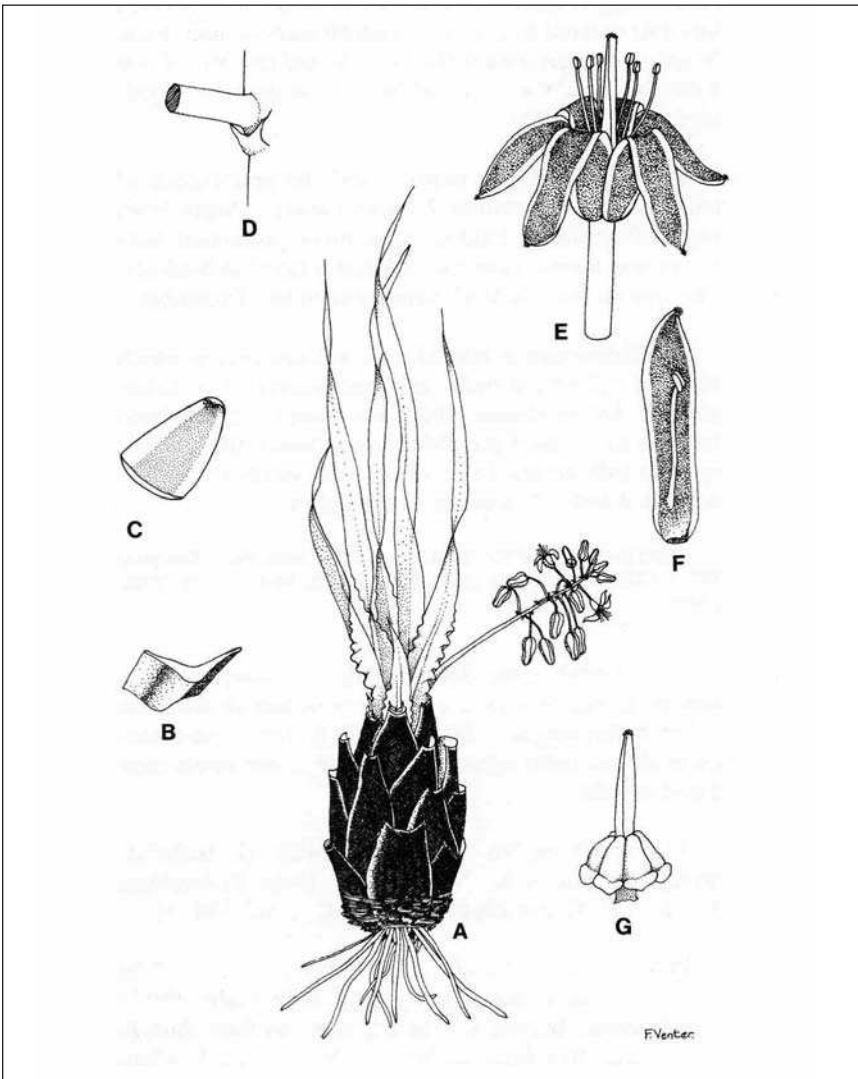
The only species with which *L. asperifolia* can be confused is *L. revoluta* (L.f) Jessop, but the tongue-shaped asperities on the leaves and scape are however diagnostic.

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**Fig. 4. *Ledebouria asperifolia*.** **A**, habit  $\times 1$ ; **B**, lamina margin  $\times 300$ ; **C**, leaf apex  $\times 10$ ; **D**, section through lamina  $\times 4$ ; **E**, bract  $\times 10$ ; **F**, tepal apex  $\times 20$ ; **G**, flower  $\times 10$ ; **H**, tepal with stamen  $\times 10$ ; **I**, ovary lateral view  $\times 10$ ; **J**, ovary distal view  $\times 10$ . All from Venter 13249.

3. *Ledebouria atrobrunnea* S. Venter. Bothalia 28 (1): 15 (1998).

Type: South Africa – North West Province, Rustenburg, Kroondal, farm Zuurplaat 337. Venter 13460 (PRE!, holo.; NU!; UNIN!, iso.).



**Fig. 5.** *Ledebouria atrobrunnea*. **A**, habit  $\times 1$ ; **B**, section through lamina  $\times 5$ ; lamina margin  $\times 300$ ; **C**, tepal apex  $\times 20$ ; **D**, bract  $\times 20$ ; **E**, flower  $\times 10$ ; **F**, tepal with stamen  $\times 10$ ; **G**, ovary lateral view  $\times 10$ . Drawn from Venter 13460 and is associated with closed deciduous low woodland.

SYNOPSIS OF THE GENUS *LEDEBOURIA* ROTH (HYACINTHACEAE) IN SOUTH AFRICA**Diagnostic Features:**

The hard purplish-brown dead bulb scales, erect twisted glaucous leaves that are undulate in the lower half, longitudinally ridged rachis and the presence of apical and basal lobes on the ovary.

**Discussion:**

*Ledebouria atrobrunnea* is related to *L. dolomiticola* S. Venter and *L. viscosa* Jessop, which also have cylindrical bulbs with membranous dead bulb scales and erect leaves. *L. atrobrunnea* is distinguished by its linear-lanceolate, non-viscid, twisted leaves and its hard purplish-brown (hence the specific epithet) bulb scales.

4. *Ledebouria concolor* (Baker) Jessop, Journ. S. Afr. Bot. 36(4): 254 (1970).

Type: South Africa - Cap. B. Spei, Cooper s.n. (K!, holo.; PRE!, photo.).

*Drimia cooperi* Baker in Saund. Ref. Bot. 1: t.18 (1868).

*Scilla concolor* Baker in Saund. Ref. Bot. 3, Appen.: 13 (1870).

Type: As for *Drimia cooperi*.

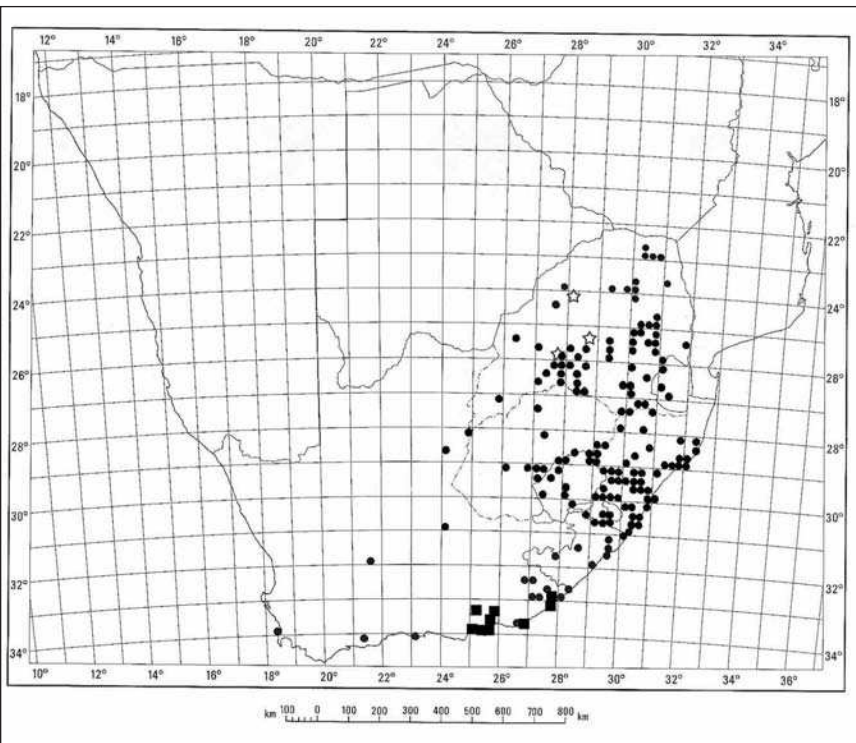


Fig. 6. Known distribution of *L. concolor* (squares), *L. confusa* (stars) and *L. cooperi* (filled circles).



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**Diagnostic Features:**

The semi-epigeal gregarial bulbs with purplish-brown dead bulb scales with prominent transverse ridges, truncate live bulb scale apices, basal stem, concolorous leaves with prominent venation, obtuse lamina apex, smooth rachis and the bracts that are either vestigial or absent.

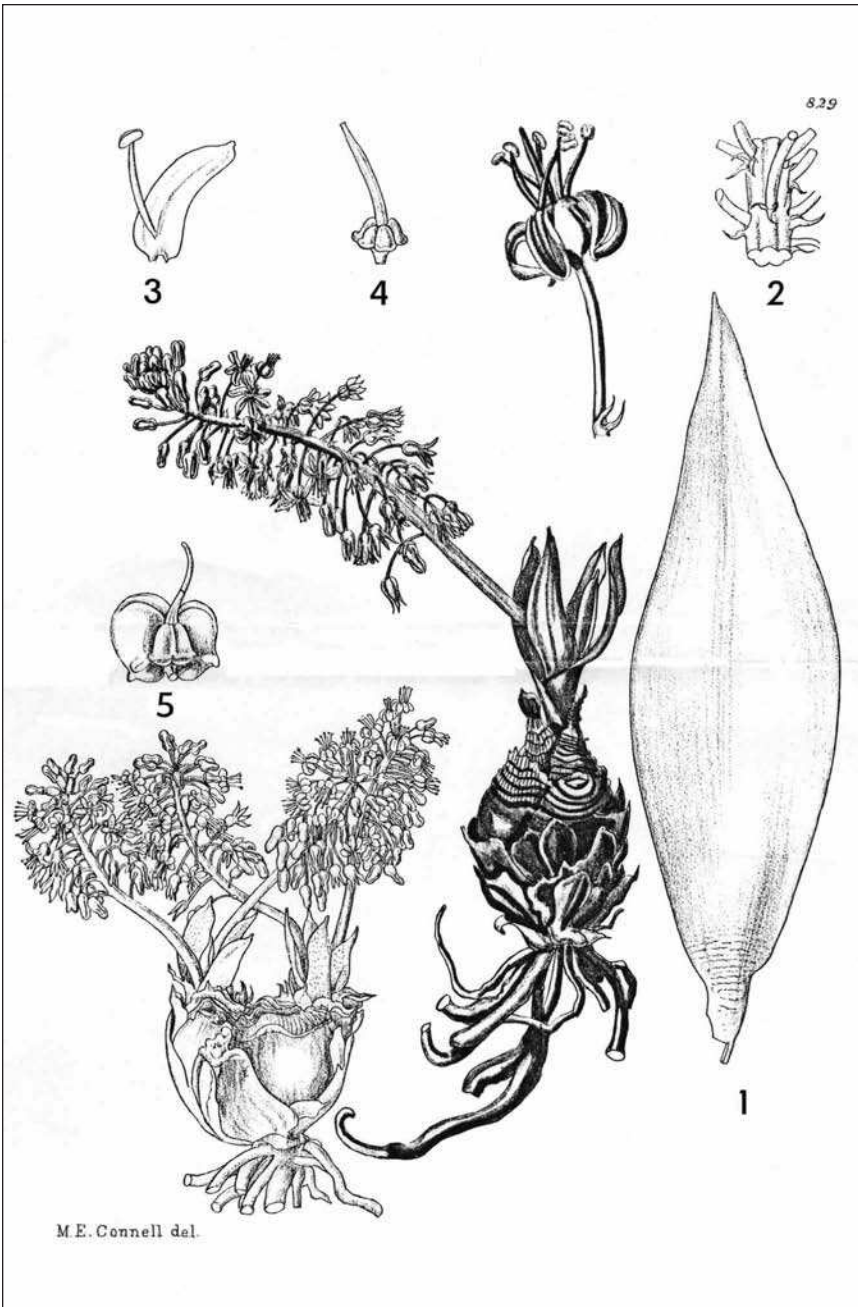
**Discussion:**

*L. concolor* is allied to *L. venteri* Van Jaarsv. & A.E. van Wyk in the gregarious semi-epigeal bulbs and concolorous leaves, but it has different inflorescence morphology.

5. *Ledebouria confusa* S. Venter, sp. nov., Type: South Africa. Franspoort, 25 miles NE of Pretoria. 23.xiii.1934. Mogg 14929 (PRE, holo.!).

*Ledebouriae atrobrunneae* S.Venter affinis sed ab illa bulbis pro parte epigeis, squamis brunneis, induratis, horizontaliter cristatis vestitis, foliis in parte ad anthesin emersis, pagina abaxiale infera lineis horizontalibus numerosis ornata tepaliscum apice obuso discedit.

Plants gregarious. *Bulb* semi-epigeal, 60–100 × (40-)70–100 mm, dead bulb scales purplish-brown, hard, apices with horizontal ridges, with threads when torn, live bulb scales purplish-pink inside. *Leaves* partly emerged at anthesis, (5-)6–10, erect-spreading, ovate-lanceolate, 80–150 × (50-)68–90 mm, with threads when torn, dull glaucous, abaxial surface with many horizontal purple lines in lower half; margins white and slightly wavy; apex acute to obtuse and prominently folded closed. *Inflorescences* 1–3, flaccid, longer than the leaves; *peduncle* glabrous, flattened at base, glaucous spotted purple at base, (40-)90–110 mm long; *rachis* longitudinally ridged; raceme 50–130 × (30-)40–50 mm; *bracts* and bracteoles always present, membranous, 0.5–1.0 × 0.25 mm, linear, white. *Pedicels* spreading horizontally, (7-)10–20 mm long, green. *Tepals* strongly recurved, sub equal, oblong, (6-)7–9 × 1.5–2.0 mm, light pink to green, keel green; apex obtuse, thinly cucullate. *Stamens* with filaments 4–5 mm long; olive green at base then bright purple, epitepalous. *Ovary* 1–2 × 2.5–3.0 mm, 6-lobed, lobes narrowly transversely oblong, apex shoulders absent, basal lobes present; stipe 0.25 mm long; *style* 3.8–4.0 mm long, purple with lower ¼ white. *Capsule* globose, base truncate. *Flowering*: Late July to October (Fig. 7).

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**Fig. 7. *Ledebouria confusa*.** 1, mature leaf; 2, portion of axis showing bracts; 3, perianth segment with stamen; 4, gynoecium; 5, young capsule with only 2 carpels maturing seeds. (Illustration from FPSA Plate 829 (1941), courtesy of SANBI).

**Diagnostic Features:**

Semi-epigeal bulbs with hard purplish-brown dead bulb scales with horizontal ridges at the apex, bulb pinkish inside, leaves concolorous, dull glaucous green, partly emerged at anthesis, abaxial surface with many horizontal purple lines in lower half, rachis longitudinally ridged, bracteoles present, tepals strongly recurved and with obtuse apices.

**Discussion:**

*Ledebouria confusa* is similar to *L. atrobrunnea* but the plants are gregarial. The dry bulb scales have many thickened horizontal ridges and the leaves are partly emerged at anthesis, also much broader and non-spiral.

6. *Ledebouria cooperi* (Hook.f.) Jessop, Journ. S. Afr. Bot. 36(4):247 (1970).  
*Scilla cooperi* Hook.f., Bot. Mag. 92:t.5580 (1866). Type: **South Africa**.  
 Cape, *Cooper s.n.* (K!, holo.; PRE!, photo.).  
*Scilla subglauca* Baker, Saund. Ref. Bot. 3:t.186 (1870). Iconotype: Saund.  
 Ref. Bot.3:t.186, "Cape of Good Hope, Cooper s.n."  
*Scilla concinna* Baker, Saund. Ref. Bot. 4:t.235 (1870). Type: Saund. Ref.  
 Bot. 4:t.235. "Cape Colony, Cooper s.n."  
*Scilla exigua* Baker, Journ Linn. Soc. (Bot.) 13:247 (1873). Type: **South Africa**.  
 Natal, Camperdown, Farm Assegai Kraal, Sanderson 670 (TCD, holo!).  
*Scilla barberi* Baker, Journ. Linn. Soc. (Bot.) 13:247 (1873). Type: **South Africa**.  
 Transkei, Ad ripas fluminis Tsomo, Barber 805. Type not found.  
*Scilla saturata* Baker, Journ. Bot. 3:365 (1874). Type: **South Africa**. Orange  
 Free State, Cooper 993 (K!, holo.; PRE!, photo.).  
*Scilla adlamii* Baker, Gdnrs' Chron. 9(3):521 (1891). Type: **South Africa**.  
 Natal, Adlam s.n. (K!, holo.; BOL!, drawing; PRE!, photo.).  
*Scilla fehri* Baker, Bot. Jahrb. 15(35):7 (1892). Type: **South Africa**.  
 Transvaal, Pretoria, Fehr s.n. (Z!, holo.).  
*Scilla inandensis* Baker, Flora Cap. 6:483 (1896). Type: **South Africa**. Natal,  
 Inanda, Wood 630 (SAM!, lecto.; BOL!; NH!).  
*Scilla globosa* Baker, Flora Cap. 6:484 (1896). Type: **South Africa**. Natal,  
 Griqualand Orientalis, In humilosis prope Kokstad, Tyson 1557.  
 (SAM!, holo.; BOL!).



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- Scilla rogersii* Baker, Flora Cap. 6:486 (1896). Type: **South Africa**. Cape Colony, Rogers s.n. (K!, holo.; PRE!, photo.).
- Scilla palustris* Wood & Evans, Journ. Bot. 37:251 (1899). Type: **South Africa**. Natal, in swamp near Newcastle, Wood 6501 (NH!, holo.; PRE!, photo.).
- Scilla rehmannii* Baker, Bull. Herb. Boiss. 2(1):853 (1901). Type: **South Africa**. Natal, Inanda, Rehmann 8277 (Z!, holo.).
- Scilla aggregata* Baker, Bull. Herb. Boiss. ser. 2(4):1001 (1904). Type: **South Africa**. Transvaal, Modderfontein, Conrath 701 (K!, holo.; GRAZ; PRE!, photo.).
- Scilla tristachya* Baker, Bull. Herb. Boiss. ser. 2(4):1001 (1904). Type: **South Africa**. Transvaal, Modderfontein, Conrath 693 (GRAZ, holo.; BOL!, drawing; PRE!, photo.; Z.).
- Scilla conrathii* Baker, Bull. Herb. Boiss. ser. 2(4):1002 (1904). Type: **South Africa**. Transvaal, Modderfontein, Conrath 699 (K!, holo.; GRAZ; PRE!, photo.).
- Scilla londonensis* Baker, Bull. Herb. Boiss. ser. 2(4):1002 (1904). Type: **South Africa**. Cape, East London, Conrath 694 (GRAZ; PRE!, photo.).
- Scilla glaucescens* Van der Merwe, Flower. Pl. S. Afr. 23:t.912 (1943). Type: **South Africa**. Transvaal, Carolina, on farm Onbekend, Van der Merwe 2073 (PRE!, holo.).

**Diagnostic Features:**

The loosely arranged live bulb scales with no threads when torn, solitary cataphyll, light green lamina margin, smooth rachis, spreading to recurved pink to deep pink tepals (sometimes with a greenish keel), obtuse and strongly cucullate tepal apices, free stamens, raised apices of the ovary shoulders and the seed yellowish-brown to brown.

Variation: A most variable species especially in the shape and coloration of the leaves.

7. *Ledebouria coriacea* S. Venter, sp. nov. Type: **South Africa**. Eastern Cape, Port Elizabeth, 'The Aloes' Railway Station, Venter 13307 (PRE!, holo.; NU!; UNIN!).

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Ad *L. cooperi* (Hook.f.) Jessop arcte affinis sed foliis coriaceis marginibus incrassatis; inflorescentia erecta solitaria et ovarii lobis ad apicem conspicue rotundatis prominentibus bene distinguenda.

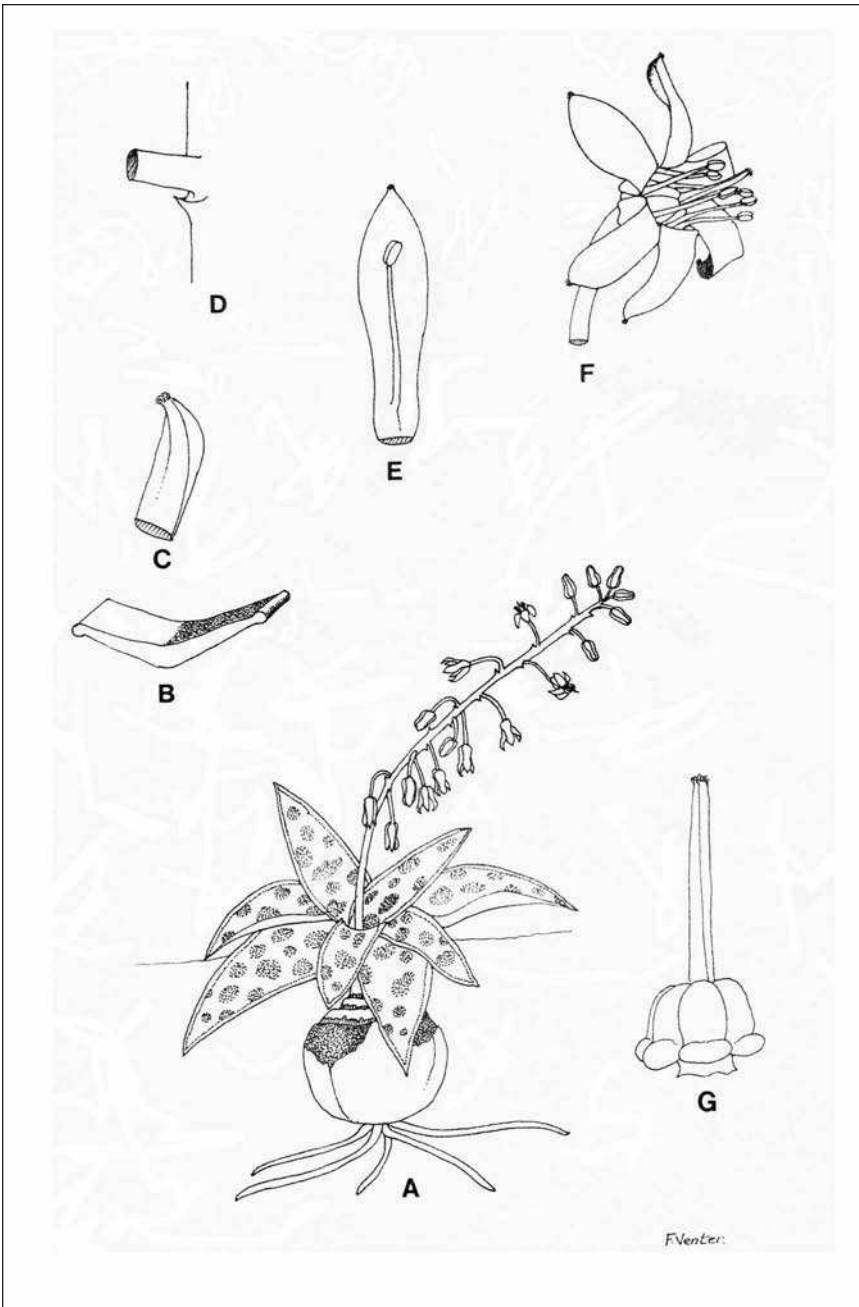
Plants gregarious. *Bulb* 30-40 × 15-20 mm; dead bulb scales brown, apices attenuate, live bulb scales fleshy, with threads when torn. *Leaves* fully developed at anthesis, 2-9, spreading but mostly appressed, lanceolate, 30-50 × 8-15 mm, with sparse threads when torn, leathery, surfaces dull, green with faint darker green blotches, venation obscure; margins thickened; apex acute. *Inflorescence* solitary, lax, 30-40 × 15-20 mm, erect, longer than the leaves; scape terete at base, glabrous; rachis smooth, 40-50 mm long. *Bracts* fleshy, 0.75 × 0.75 mm, deltoid, green with bracteoles. *Pedicels* cernuous, 5 mm long, speckled pink soon turning green. *Perianth* 5 mm long, tepals recurved, oblong, 5 × 1.5 mm, apex acute, slightly cucullate, green suffused purple. *Stamens* erect, filaments 3 mm long, upper part purple, lower part white, base slightly flattened, epitepalous; anthers 1 mm long, violet. *Ovary* ovoid, 6-lobed, 1.25 × 2 mm, lobes deltate, apex shoulders raised. *Style* 3.2-3.5 mm long, triangular, glabrous, purple; stigma above anthers; stipe 0.5 × 0.5 mm. *Capsule* globose; base truncate. *Seed* drop-shaped, 2 mm long, surface strongly wrinkled, brown. *Flowering*: From October to December (Fig. 8).

**Diagnostic Features:**

Attenuate bulb scales, leathery leaves with dull surfaces and thickened margins, solitary erect inflorescence with a smooth rachis and fleshy deltoid bracts with bracteoles.

**Discussion:**

*L. coriacea* is not closely allied to other *Ledebouria* species.

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**Fig. 8. *Ledebouria coriacea*.** **A**, habit  $\times 2$ ; **B**, section through lamina  $\times 5$ ; **C**, lamina margin  $\times 300$ ; **D**, bract  $\times 10$ ; **E**, tepal with stamen  $\times 10$ ; **F**, flower  $\times 10$ ; **G**, gynoecium lateral view  $\times 10$ . All from Venter 13307.

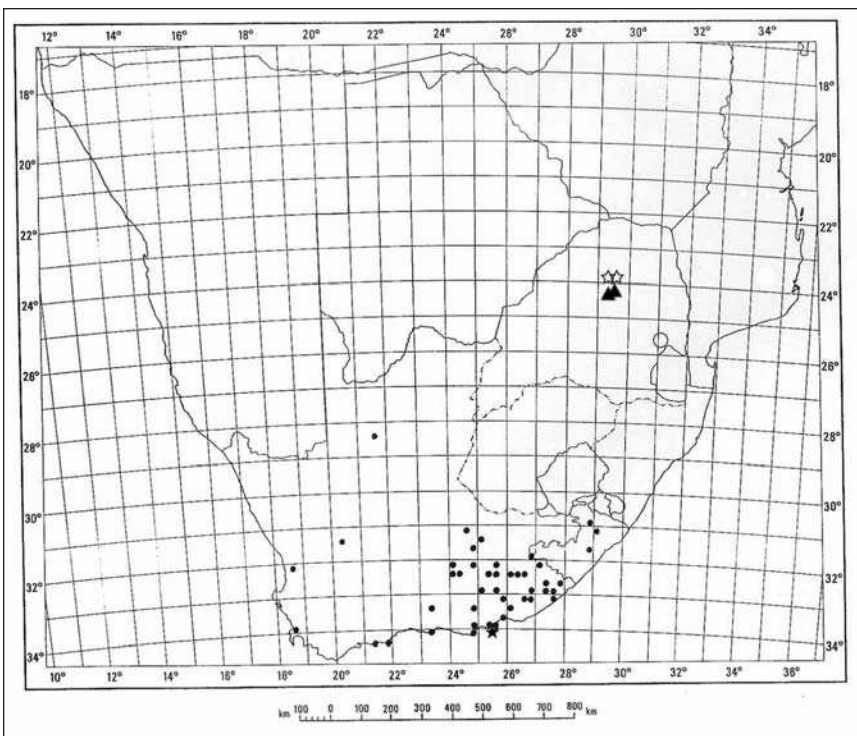


Fig. 9. Known distribution of *L. coriacea* (filled star), *L. crispa* (stars), *L. cremnophila* (circle), *L. dolomiticola* (filled triangles) and *L. ensifolia* (filled circles).

8. *Ledebouria crispa* S. Venter, Bothalia 28(2):179 (1998). Type: South Africa – Northern Province, Pietersburg, Farm Majebes Kraal 1002 LS, Venter 11202 (PRE!, holo.; UN!; UNIN!).

#### Diagnostic Features:

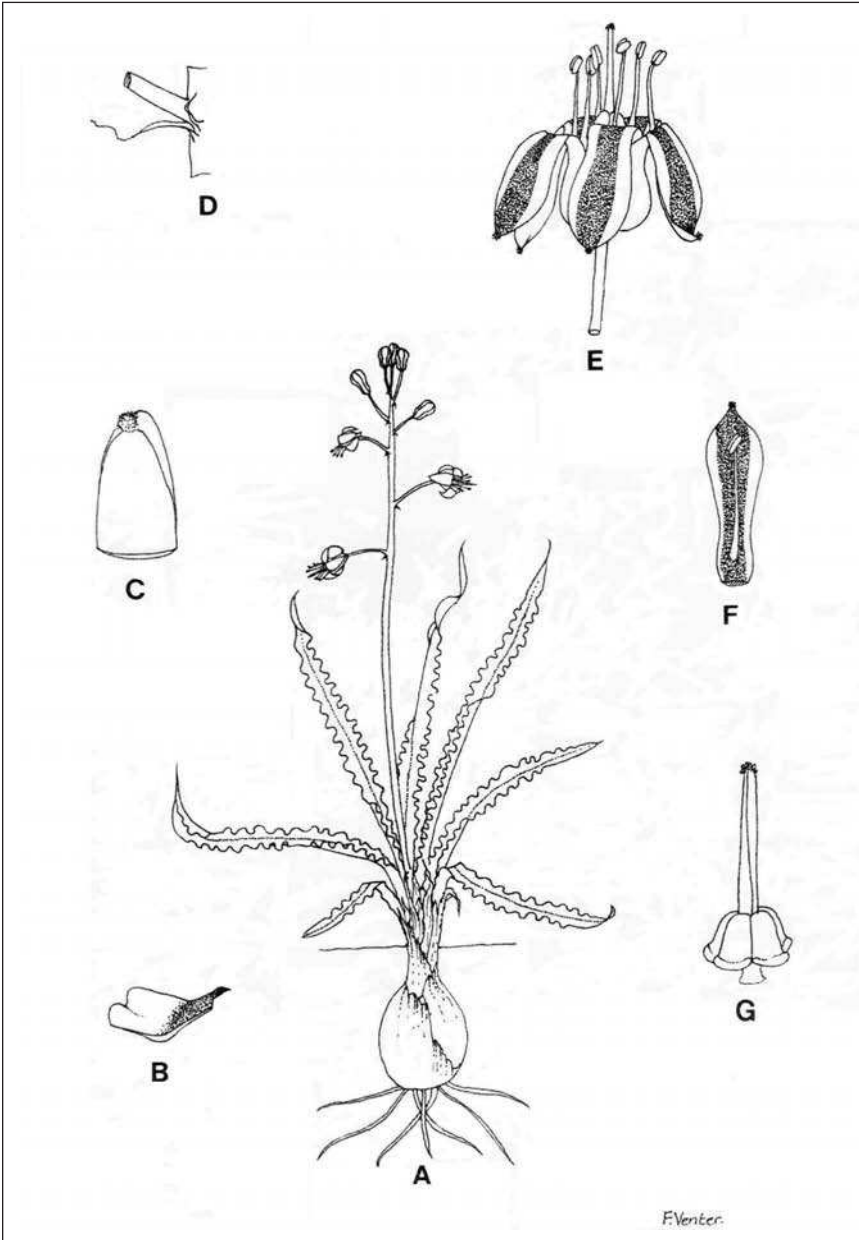
The semi-epigeal to epigeal bulbs with membranous honey-brown dead bulb scales, prominent neck to the bulb, leaves dull glaucous green with undulate to crispate margins, solitary erect and lax inflorescence, smooth rachis, white membranous bracts with bracteoles, apex of ovary tapering into the style and the black seeds.

#### Discussion:

*L. crispa* is closely related to *L. undulata* (Jacq.) Jessop but differs in having the bulb 15-25 mm long whereas with *L. undulata* the bulb can be 30-50 mm long. In *L. crispa* the leaves are present at flowering, the leaf margin

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always crisped and 2-3(-5) mm wide whereas in *L. undulata* the leaves are absent and the leaf margin is only undulate and 8-20 mm wide and rather firmer in texture.



**Fig. 10. *Ledebouria crista*.** **A**, habit  $\times 1$ ; **B**, section through lamina  $\times 5$ ; **C**, tepal apex  $\times 5$ ; **D**, bract with bracteole  $\times 10$ ; **E**, flower  $\times 10$ ; **F**, tepal with stamen  $\times 10$ ; **G**, gynoecium lateral view  $\times 10$ . Drawn from Venter 11202.



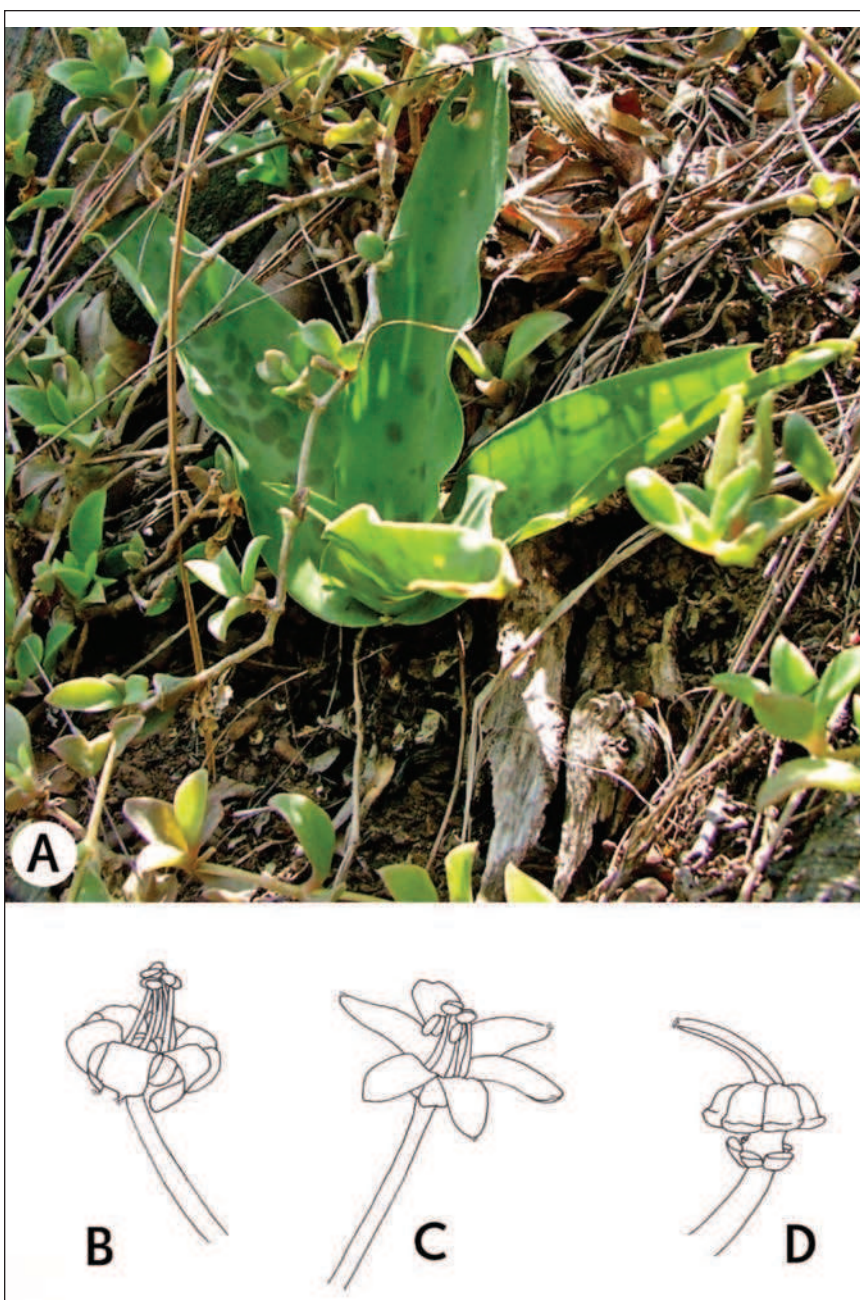


Fig. 11. *Ledebouria cremnophila*. Plant from the type locality (Photo Ernst van Jaarsveld).

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9. *Ledebouria cremnophila* S. Venter & E.J. van Jaarsv., *Aloe* 43(4):78-79(2006). Type: **South Africa**. Mpumalanga Province. 2531(Barberton): Farm Crystal Stream 323 JU, on cliff next to Honeybird Creek, (-CA), Venter 13671 (PRE, holo!).

**Diagnostic Features:**

The bulbs are cylindrical and semi-epigeal to epigeal, dry bulb scales dark brown and the filiform flower bracts form a prominent coma that is very prominent in the young inflorescence.

**Discussion:**

*Ledebouria cremnophila* is related to *L. revoluta* but differs in the semi-epigeal to epigeal cylindrical bulbs with dark-brown dry-bulb scales and the filiform flower bracts that form a prominent coma in the young inflorescence.

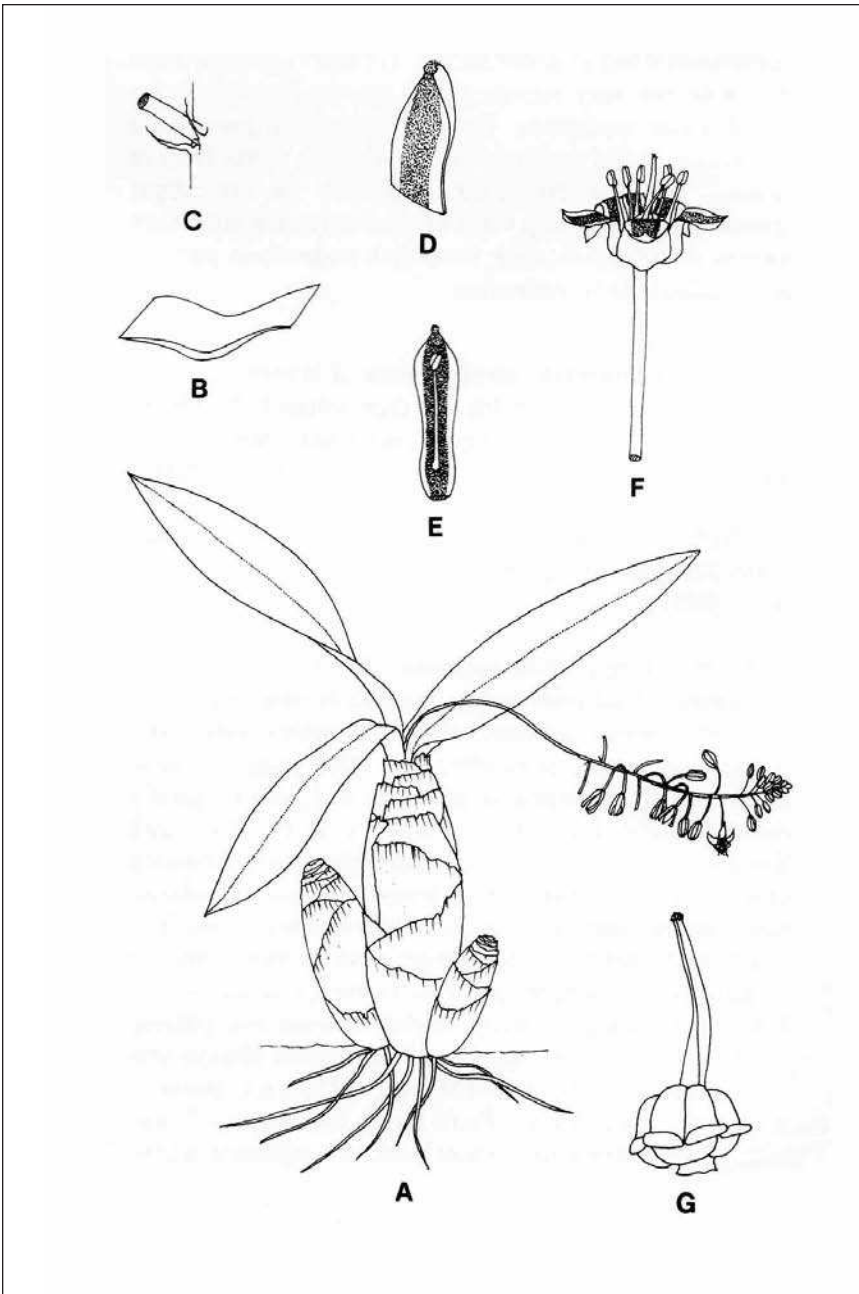
10. *Ledebouria dolomiticola* S. Venter, *Bothalia* 28(1):16 (1998). Type: **South Africa**. Limpopo Province, Strydpoort Mountain, Donkerkloof, Farm Rivierplaats 354, Venter 13089a (PRE!, holo.; NU!, UNIN!).

**Diagnostic Features:**

Characterized by the epigeal cylindrical bulbs, dry bulb scales thinly membranous, bulblets on basal stem, glaucous concolorous erect leaves, solitary lax and flaccid inflorescence, smooth rachis, presence of bracteoles, globose 6-lobed ovary with raised apex shoulders and the globose seed.

**Discussion:**

*L. dolomiticola* is closely related to *L. atrobrunnea* and *L. viscosa* Jessop in the cylindrical bulbs, erect leaves (uncommon in *Ledebouria*) and the apex of the ovary forming prominent shoulders. *L. dolomiticola* differs from both in its epigeal bulbs and membranous dead bulb scales.



**Fig. 12. *Ledebouria dolomiticola*.** **A**, habit  $\times 0.3$ ; **B**, section through lamina  $\times 1.3$ ; **C**, bract and bracteole  $\times 4$ ; **D**, tepal apex  $\times 6$ ; **E**, tepal with stamen  $\times 4$ ; **F**, flower  $\times 4$ ; **G**, ovary lateral view  $\times 6$ . Drawn from Venter 13208a.



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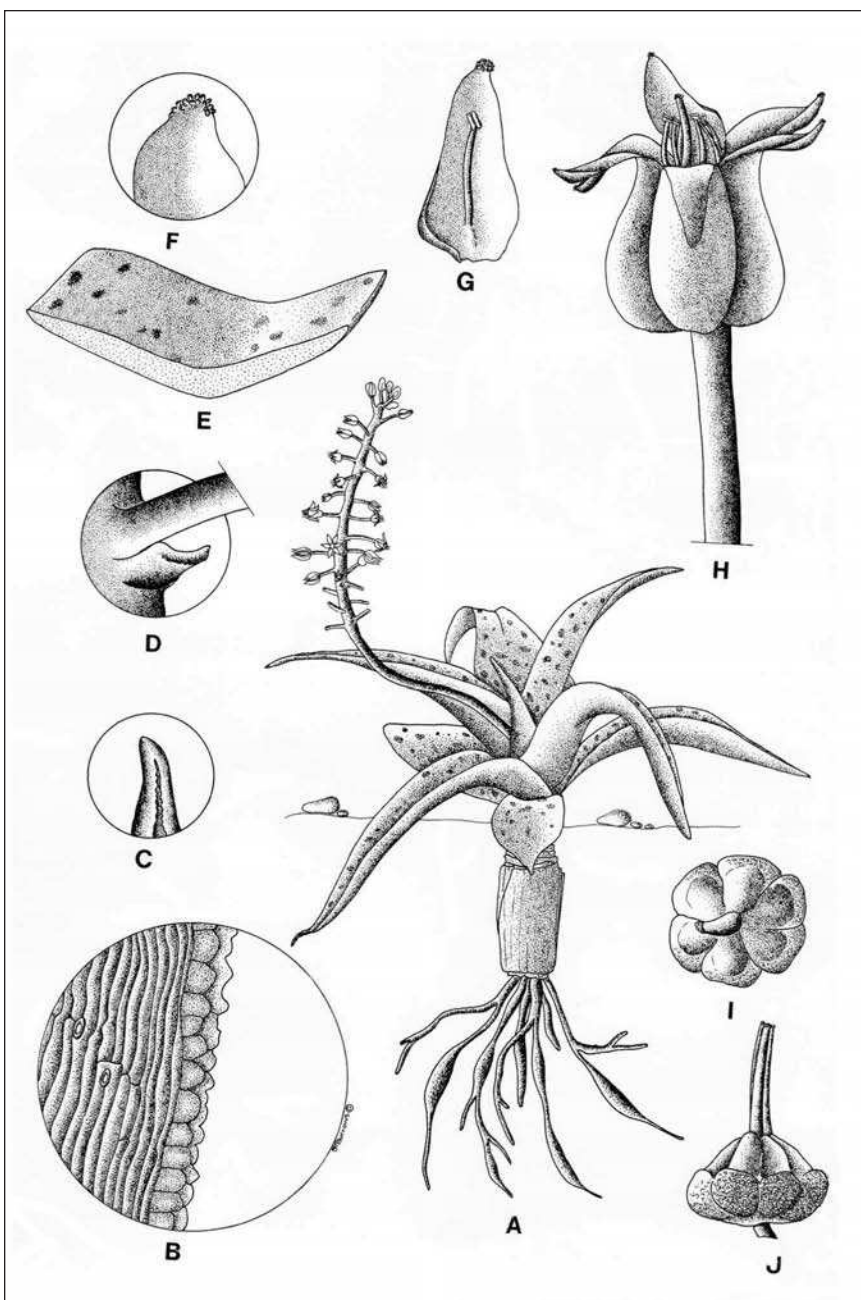
11. *Ledebouria ensifolia* (Eckl.) S. Venter & T.J. Edwards, *Bothalia* 33(1):49 (2003). Type: **South Africa**. Cape, Uitenhage District, Zwartkops River. Zeyher 10 (K!, lecto.—selected here; PRE!, photo).  
*Drimia ensifolia* Eckl., *S. Afr. Quart. Journ.* 1:364 (1830). Type: As for *L. ensifolia*.  
*Scilla ensifolia* (Eckl.) Britten, *Journ. Bot.* 46:201 (1908). Type: As for *L. ensifolia*.  
*Drimia ludwigii* Miq., *Bull. Sc. Phys. Neerl.*:39 (1839). Type: **South Africa**. Cape, Cap B. Spei, Ecklon & Zeyher 1064 (U, holo.; GRA!; PRE!).  
*Idothea ludwigii* Kunth, *Enum. Pl.* 4: 681 (1843). Type: As for *Drimia ludwigii*.  
*Scilla prasina* Baker, *Saund. Ref. Bot.* 3 (App.):10 (1870). Type: **South Africa**. Cape, Kaffirland, Gill s.n. (K!, holo.; PRE!, photo.).  
*Scilla ludwigii* Baker, *Saund. Ref. Bot.* 3 (App.):9 (1870). Type: **South Africa**. Cape, Cap B. Spei. Zeyher 4262 (K!, holo.; PRE!).  
*Scilla pusilla* Baker, *Journ. Bot., Lond.* 5:183 (1876). Type: **South Africa**. Transkei, Bazeia. Bauer 293 (K!, holo.; BOL!, drawing; PRE!, photo.).  
*Scilla ecklonii* Baker, *Bot. Jahrb.* 15(35):7 (1892). Type: **South Africa**. Cape, Tambukiland, mountains between Silo and Windvogelberg. Ecklon & Zeyher 12 (B!, holo.).

**Diagnostic Features:**

The combination of cylindrical bulbs, dark-brown dead-bulb scales, glaucous ensiform leaves, small flowers and papillate bases of the ovary lobes.

**Discussion:**

*Ledebouria ensifolia* is related to *L. apertiflora* sharing fusiform roots, dark dry-dead bulb scales, acute tepals and the apex of the ovary with prominent shoulders. It differs from *L. apertiflora* in the cylindrical bulbs, ensiform leaves and the inflorescences, which are longer than the leaves.



**Fig. 13. *Ledebouria ensifolia*.** **A**, habit  $\times 1$ ; **B**, lamina margin  $\times 300$ ; **C**, lamina apex  $\times 10$ ; **D**, bract  $\times 10$ ; **E**, section through lamina  $\times 5$ ; **F**, tepal apex  $\times 20$ ; **G**, tepal with stamen  $\times 10$ ; **H**, flower  $\times 10$ ; **I**, ovary dorsal view  $\times 10$ ; **J**, ovary lateral view  $\times 10$ . Drawn from Smith 155.

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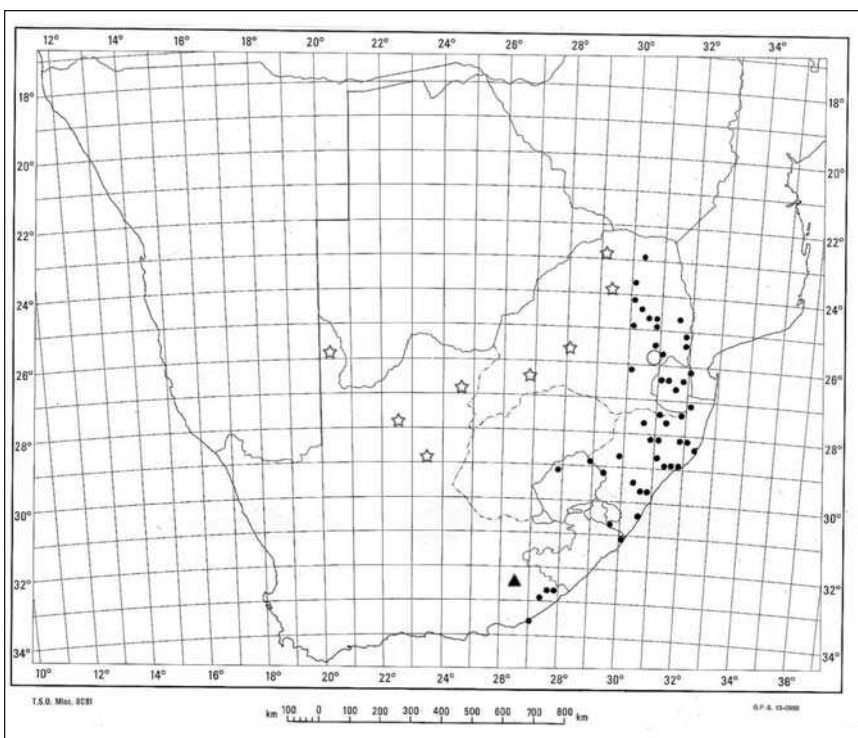
12. *Ledebouria floribunda* (Baker) J.P. Jessop, Journ. S. Afr. Bot. 36(4):251 (1970). Type: **South Africa**. Cap. b. Spei, Cooper s.n. (K!, holo.; PRE!, photo.).  
*Scilla floribunda* Baker, Saund. Ref. Bot. 3:t.188 (1870). Type: Same as for *Ledebouria floribunda*.  
*Scilla pendula* Baker, Saund. Ref. Bot. 3 Appendix:14 (1870). Type: **South Africa**. Cape of Good Hope, Burchell s.n. (K!, holo.; BOL!, drawing).  
*Scilla princeps* Baker, Saund. Ref. Bot. 3:t.189 (1870). Type: **South Africa**. Cape of Good Hope, Cooper s.n. (K!, holo.; PRE!, photo.).  
*Scilla polyantha* Baker, Gardnr's Chron. 9:104 (1878). Type: **South Africa**. Natal, York, Bull s.n. (K!, holo.; PRE!, photo.).  
*Scilla tricolor* Baker, Gardnr's Chron. 14:230 (1880). Type: **South Africa**. Cape, Port Elizabeth, Elwes s.n. (K!, painting; BOL!, copy of painting; PRE!, photo. of painting).  
*Scilla subsecunda* Baker, Gardnr's Chron. 16:38 (1881). Type: **South Africa**. Cape, Eastern Districts, Bowker 218 (K!, holo.; BOL!, drawing; PRE!, photo. ).  
*Scilla lauta* N.E. Br., Kew Bull.:299 (1921). Type: **South Africa**. Transvaal, Pietersburg Div., The Downs, Rogers 23990 (K!, holo.; BOL!, drawing; PRE!, photo.).

**Diagnostic Features:**

Live bulb scales lacking threads when torn, leaves fully developed at anthesis, leaves 200-300 × 40-50 mm, with threads when torn, inflorescences dense, 60-100-flowered, rachis ridged and 150-225 mm long, bracts and bracteoles membranous, pedicels longer than 12 mm, tepal apices obtuse and cucullate, ovary 6-lobed with the apex tapering into the style, basal lobes present and seeds pear-shaped.

**Discussion:**

*L. floribunda* can be confused with *L. revoluta* but differs in the bulb scales having threads when torn, tepals 2-4 mm longer, stigma and stamens equal height, ovary widely trullate not narrowly transversely elliptic and the seed 3.0-3.5 mm longer.



**Fig. 14.** Known distribution of *L. floribunda* (filled circles), *L. galpinii* (open circle), *L. glauca* (open stars) and *L. hypoxioides* (filled triangle).

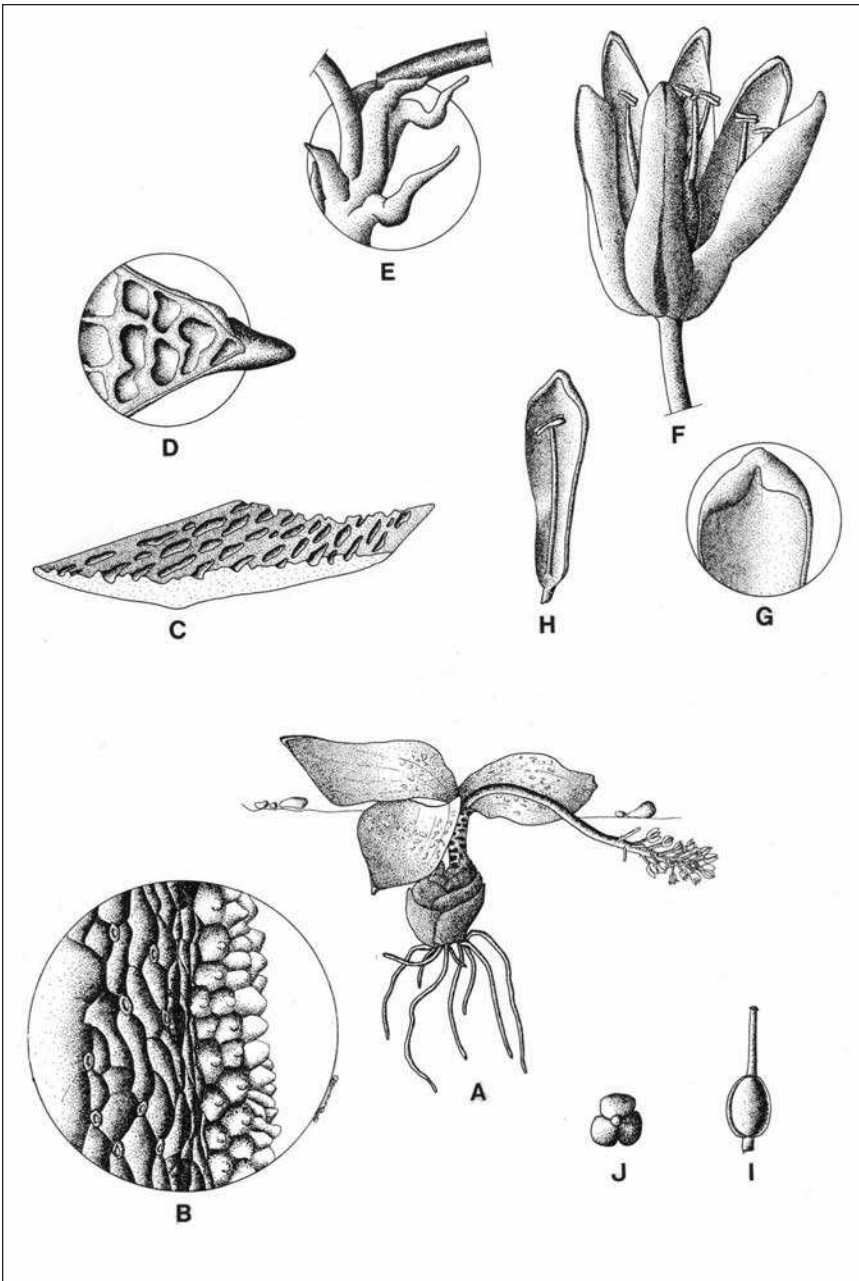
13. *Ledebouria galpinii* (Baker) S. Venter & T.J. Edwards, *Bothalia* 33(1):50 (2003). Type: **South Africa**. Transvaal, summit of Devil's Kantoor, Galpin 672 (PRE! lecto; BOL!; GRA!; NH!; PRE!, photo.; SAM!; Z). Designated here as lectotype (Greuter et al. 1988).  
*Scilla galpinii* Baker, *Flora Cap.* 6:487 (1896).

#### Diagnostic Features:

The humifuse thickly fleshy, glossy purple to purplish-green, leaves with the distinctly lacunose adaxial surface make it a unique species.

#### Discussion:

This species is closely related to *L. mokobulanensis* Hankey & T.J. Edwards but differs in having humifuse leaves with prominent non-coloured lacunae or pits on the adaxial surface, flaccid inflorescences and a 3-lobed ovary.

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**Fig. 15. *Ledebouria galpinii*.** **A**, habit  $\times 1$ ; **B**, lamina margin  $\times 300$ ; **C**, section through lamina to show the lacunae  $\times 5$ ; **D**, apex of lamina  $\times 20$ ; **E**, bracts  $\times 10$ ; **F**, flower  $\times 10$ ; **G**, apex of tepal  $\times 20$ ; **H**, tepal with stamen  $\times 10$ ; **I**, ovary lateral view  $\times 10$ ; **J**, ovary distal view  $\times 10$ . All from Venter 13389.

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14. *Ledebouria glauca* S. Venter, sp. nov. Type: South Africa – Limpopo Province, Polokwane (Pietersburg), Fauna Park, Venter 13368 (PRE! holo.; NU!)

Ad *L. cooperi* (Hook.f.) Jessop cognata sed foliis coriaceis, glaucis; inflorescentiis erectis, quam foliis brevioribus; ovario basi lobato manifeste differt.

*Bulb* 15-70 × 15-30 mm, cylindrical; dead bulb scales light brown, apices truncate, attenuate only at the extreme tips, live bulb scales with threads when torn; neck 3-30 × 3-10 mm; basal stem 5-50 × 10-20 mm. *Leaves* fully developed at anthesis, 2-4, spreading, oblanceolate, 50-100 × 8-18 mm, with threads when torn, leathery, dull, glaucous with purple stripes and blotches, purple cross bars at base of leaf, venation obscure; margins finely papillate; apex acute. *Inflorescences* 1-2, 30-50 × 10-20 mm, erect, shorter than leaves; *scape* terete at base, spotted purple; *rachis* ridged, 20-30 mm long. *Bracts* membranous, 1-2 × 0.5 mm, lanceolate to bifurcate, white to pinkish purple, bracteoles present. *Pedicels* spreading horizontally, 5-8 mm long, pink. *Perianth* 5 mm long, tepals recurved, oblong, 5 × 1.5 mm, apex obtuse, cucullate, green and pink to purple with a green keel. *Stamens* erect, filaments 3-4 mm long, slightly flattened at base, maroon, epitepalous; anthers 1 mm long, yellow. *Ovary* ovoid, 6-lobed, 0.5 × 1 mm, lobes narrowly transversely oblong, distal lobes present. *Style* 3 mm long, triangular, purple; stigma equal height to anthers; stipe 0.25 × 0.25 mm. *Capsule* globose; base truncate. *Seed* drop-shaped, 3-5 mm long, surface strongly wrinkled, brown. *Flowering*: October to December (Fig.16).

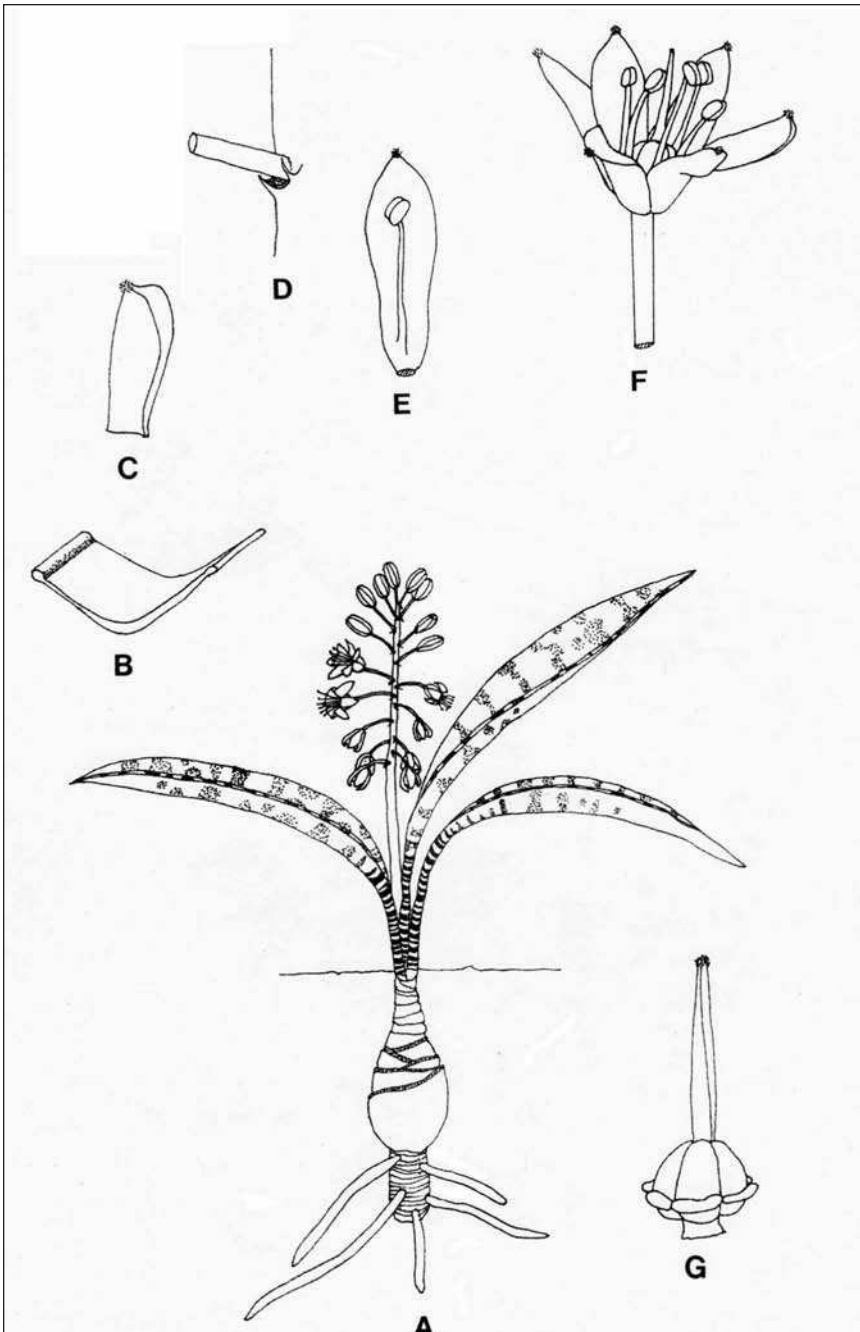
#### Diagnostic Features:

The cylindrical bulb with truncate apices to the dead bulb scales, long basal stem, leaves (2-4) fully developed at anthesis, with threads when torn, leathery, dull glaucous with purple stripes and blotches, purple cross-bars at base of leaf, 1-2 dense and erect inflorescences that are shorter than the leaves, rachis ridged, bracts and bracteoles membranous and the filaments slightly flattened at base.

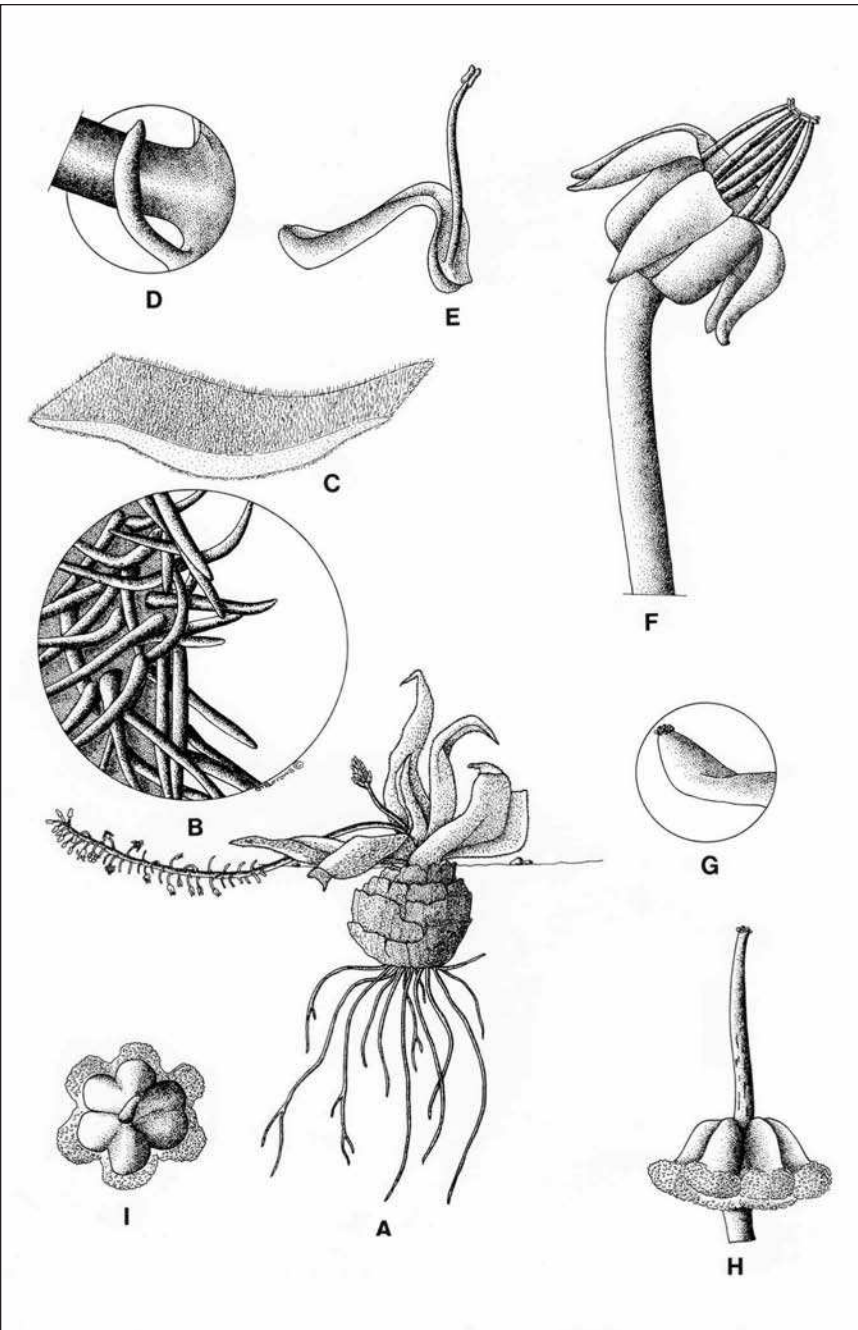
#### Discussion:

*L. glauca* is closely related to *L. inquinata* (C.A. Sm.) Jessop and *L. marginata* (Baker) Jessop but differs in having a basal stem and thickly leathery leaves.



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**Fig. 16. *Ledebouria glauca*.** **A**, habit  $\times 1$ ; **B**, section through lamina  $\times 5$ ; **C**, apex of tepal  $\times 20$ ; **D**, bract with bracteole  $\times 10$ ; **E**, tepal with stamen  $\times 10$ ; **F**, flower  $\times 10$ ; **G**, ovary lateral view  $\times 10$ . All from Venter 13368.



**Fig. 17. *Ledebouria hypoxidioides*.** **A**, habit  $\times 0.25$ ; **B**, lamina margin  $\times 110$ ; **C**, section through lamina  $\times 2$ ; **D**, bract  $\times 10$ ; **E**, tepal with stamen  $\times 10$ ; **F**, flower  $\times 8$ ; **G**, tepal apex  $\times 20$ ; **H**, ovary lateral view  $\times 10$ ; **I**, ovary distal view  $\times 10$ . All from Venter 13311.



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15. *Ledebouria hypoxidioides* (Schönland) J.P. Jessop, Journ. S. Afr. Bot. 36(4):263 (1970). Type: South Africa. Cape, Grahamstown, Daly & Sole 435 (GRA!, holo.; BOL!; SAM!; Z!).  
*Scilla hypoxidioides* Schönl., Rec. Albany Mus. 1:48 (1903).

**Diagnostic Features:**

The densely pilose leaves that are fully developed at anthesis and the red-dish-brown seed.

**Discussion:**

*L. hypoxidioides* cannot be confused with any other *Ledebouria* in being the only species with pilose leaves.

16. *Ledebouria inquinata* (C.A. Sm.) J.P. Jessop, Journ. S. Afr. Bot. 36(4):257 (1970). Type: South Africa. Transvaal, near Pretoria along Aapies River, Burke s.n. (K!, holo.; PRE!, photo.). Designated here as lectotype (Greuter et al. 1988. Article 7.5).  
*Scilla inquinata* C.A. Smith, Kew Bull. :248 (1930).

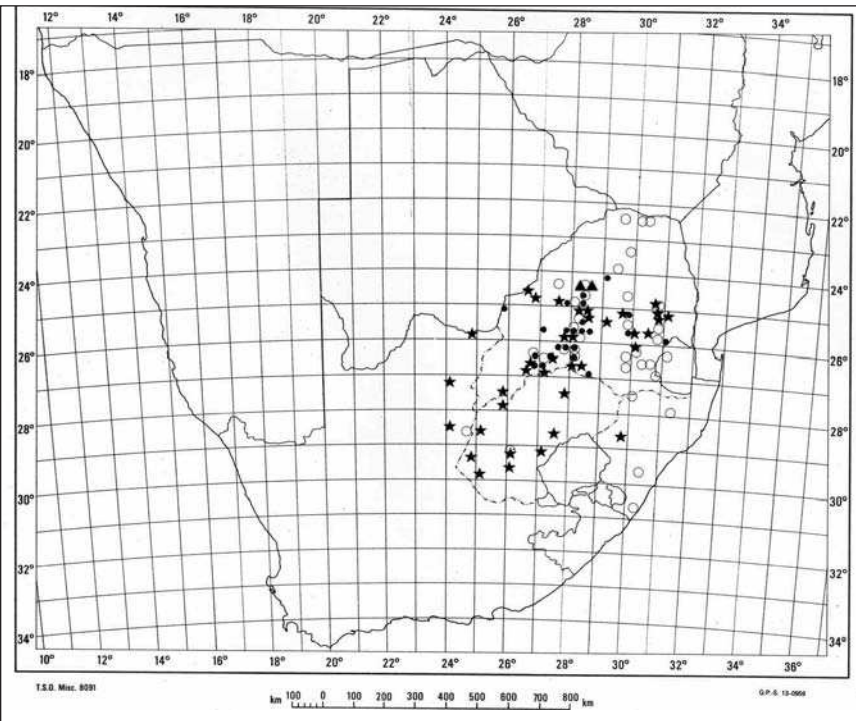


Fig. 18. Known distribution of *L. inquinata* (filled stars), *L. lepida* (filled triangles), *L. leptophylla* (circles) and *L. luteola* (filled circles).

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**Diagnostic Features:**

The apical part of the dead bulb scales are speckled purple, live bulb scales purplish, leaves partly emerged at anthesis, surfaces dull glaucous green with purple markings, margins undulate in lower third of lamina, rachis ridged, bracteoles present, ovary 6-lobed with raised apex shoulders and basal lobes present.

**Discussion:**

*L. inquinata* is similar to *L. glauca* and *L. marginata* (Baker) Jessop but is distinguished by the purple spots and blotches on the live bulb scales, leaves undulate at the base and depressed globose ovary. Jessop (1970) apparently failed to see the differences between the type specimens and material he recognized as *L. inquinata* is actually from a plant described here as *L. confusa*.

17. *Ledebouria lepida* (N.E. Br.) S. Venter, comb. nov., Type: South Africa.

Transvaal, Palala River, Breyer s.n., in Herb. Rogers 24009 (K!, holo.; BOL!, drawing; PRE!).

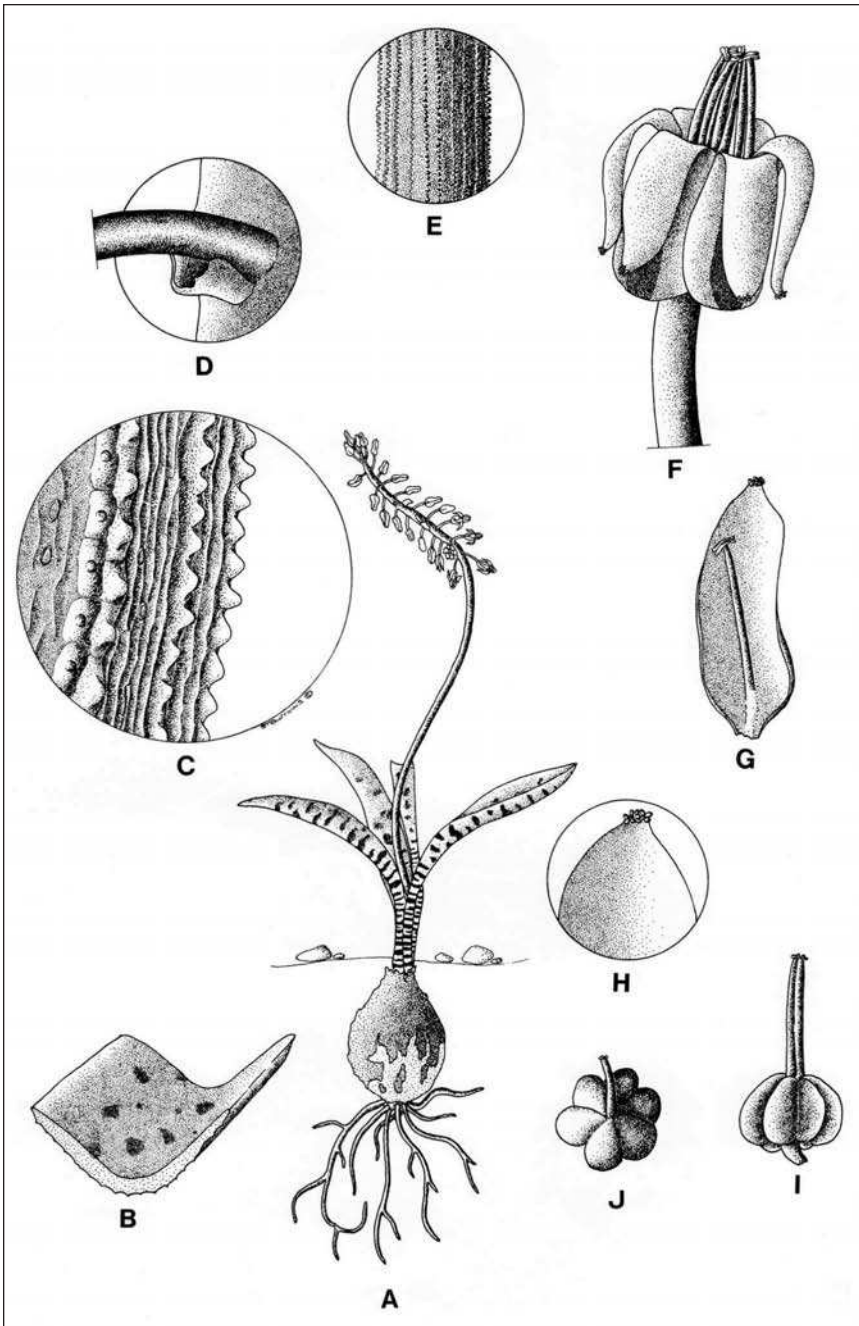
*Scilla lepida* N.E. Br., Kew Bull.: 299 (1921).

**Diagnostic Features:**

A distinctive feature of this species is the pilose scape and the small flowers.

**Discussion:**

Similar to *L. rupestris* but differs in the leaf base marked with purple cross-bars, not petiolate, erect inflorescence and pilose scape.

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**Fig. 19. *Ledebouria lepida*.** **A**, habit  $\times 1$ ; **B**, lamina margin  $\times 300$ ; **C**, bract  $\times 10$ ; **D**, hairs on peduncle  $\times 10$ ; **E**, section through lamina  $\times 2$ ; **F**, flower  $\times 10$ ; **G**, tepal with stamen  $\times 10$ ; **H**, tepal apex  $\times 10$ ; **I**, ovary lateral view  $\times 10$ ; **J**, ovary distal view  $\times 10$ . All from Venter 13415.

18. *Ledebouria leptophylla* (Baker) S. Venter, comb. nov., Type: **South Africa**. Transvaal, near Devil's Kantoor, Kaapsche Hoop. Bolus 7623 (K !, holo.; BOL !, drawing and iso.).

*Scilla leptophylla* Baker in Flora Cap. 6:483 (1896).

*Scilla graminifolia* Baker in Bull. Herb. Boiss. ser. 2(4):1001 (1904). Type: **South Africa**. Transvaal, Modderfontein, Conrath 703 (K!, holo.; BOL!, drawing; GRAZ; PRE!, photo.; Z!).

*Scilla stenophylla* Van der Merwe in Flower. Pl. S. Afr. 25: t.959 (1944).

Type: **South Africa**. Natal, Paulpietersburg, Van der Merwe 2655 (PRE!, holo.).

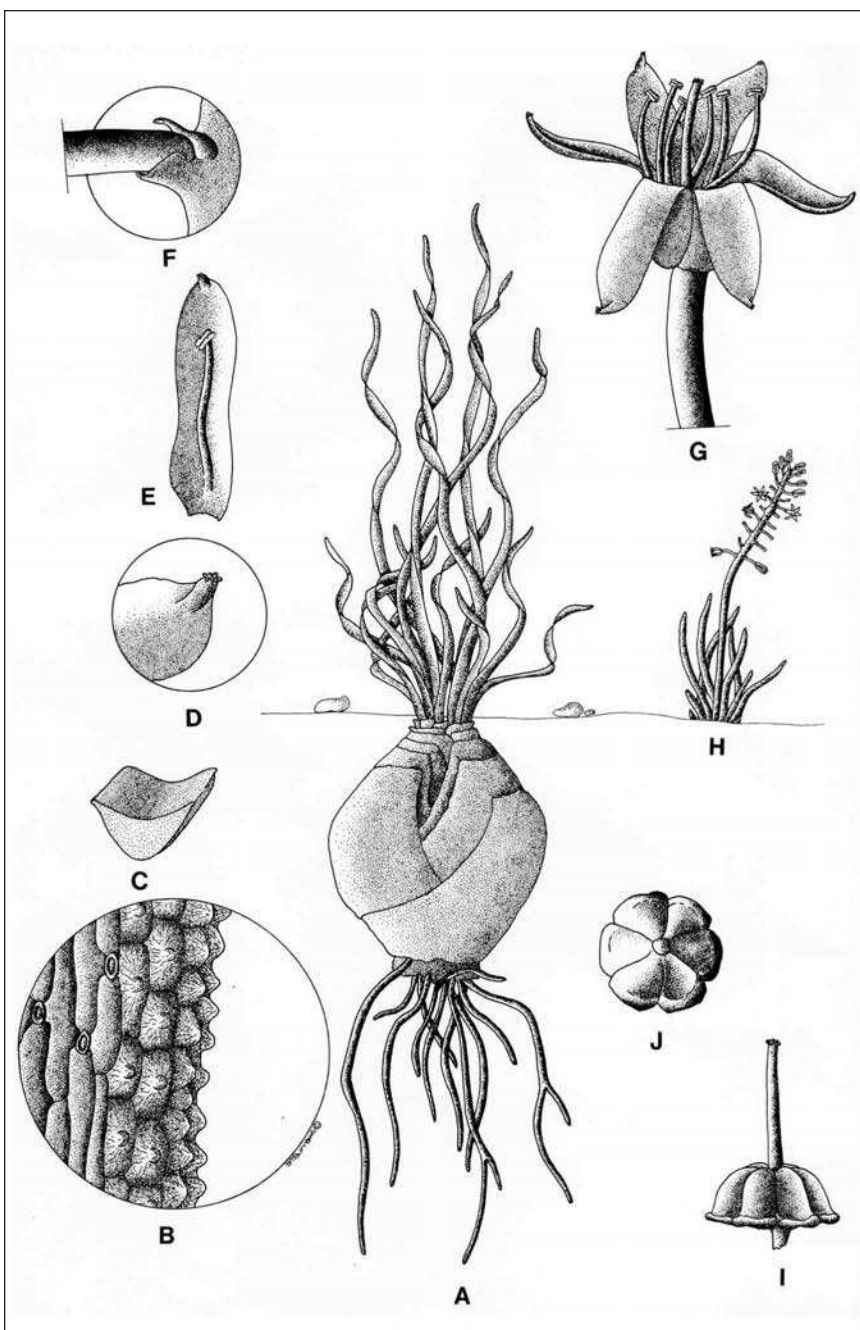
*Ledebouria graminifolia* (Baker) Jessop in Journ. S. Afr. Bot. 36(4): 259 (1970). Type: Same as for *S. graminifolia*.

#### **Diagnostic Features:**

Live bulb scales without threads when torn, leaves partly emerged at anthesis, linear, with threads when torn, with dull purple spots and cross bars at base, inflorescences longer than the leaves, rachis ridged, bracteoles present, perianth stellate, ovary 6-lobed with the apex shoulders rectangular and the seed black.

#### **Discussion:**

*L. leptophylla* is related to *L. minima* (Baker) S. Venter in having glaucous, linear leaves, stellate flowers and prominent ovary shoulders but differs in the papillate lamina margin, leaves with threads when torn, ridged rachis, prominent bracteole and ovary shoulders.

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**Fig. 20. *Ledebouria leptophylla*.** **A**, habit  $\times 1$ ; **B**, lamina margin  $\times 300$ ; **C**, section through lamina  $\times 10$ ; **D**, tepal apex  $\times 20$ ; **E**, tepal with stamen  $\times 10$ ; **F**, bract with bracteole  $\times 10$ ; **G**, flower  $\times 10$ ; **H**, habit of non spiral-leaved form  $\times 1$ ; **I**, ovary lateral view  $\times 10$ ; **J**, ovary distal view  $\times 10$ . All from Venter 13214, except **H** from Venter 13251.

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19. *Ledebouria luteola* Jessop, Journ. S. Afr. Bot. 36(4):260 (1970). Type: **South Africa**. Transvaal, 6.5 miles south of Hammanskraal, Codd 5625 (PRE!, holo.).

**Diagnostic Features:**

Live bulb scales with copious threads when torn, leaves fully developed at anthesis, with a dull luster, with copious threads when torn, inflorescences longer than the leaves, rachis ridged, bracteoles present, anthers pale violet, ovary 6-lobed with well-developed basal lobes, capsule globose and the seed brown.

**Discussion:**

*L. luteola* is closely related to *L. ovatifolia* (Baker) Jessop but differs in the apices of the bulb scales not at all truncate, leaves spreading and linear-lanceolate to lanceolate.

20. *Ledebouria macowanii* (Baker) S. Venter, Bothalia 28(2):181 (1998).

*Scilla macowanii* Baker, Gdnr's Chron. 3:748 (1875). Type: **South Africa**. Cape, Somerset Division, Boschberg, MacOwan 1841 (GRA!, lecto.; BOL!; PRE!, photo.; Z ). Here designated as lectotype (Greuter et al 1988).

*Scilla nelsonii* Baker, Flora Cap. 6:488 (1896). Type: **South Africa**. Cape, Vaal River, Nelson 167 (K!, holo.; PRE!).

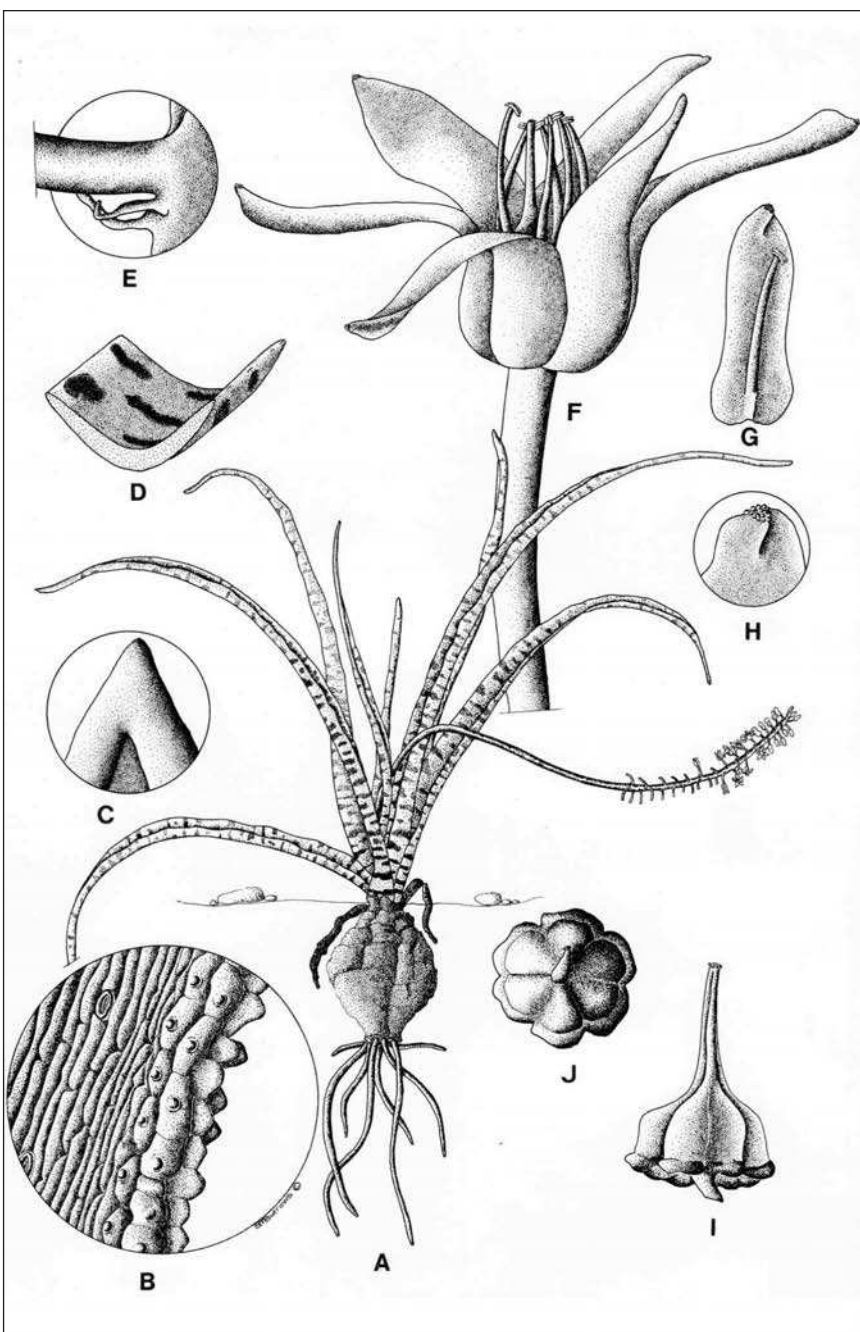
**Diagnostic Features:**

Live bulb scales without threads when torn, leaves fully developed at anthesis and without threads when torn, 1 – 2 lax inflorescences with smooth rachises, bracts fleshy and without bracteoles, flowers stellate with slightly recurved tepal apices, stamens spreading, anthers pale violet, ovary 6-lobed with apex shoulders raised.

**Discussion:**

*Ledebouria macowanii* is closely related to *L. socialis* (Baker) Jessop but the bulbs are hypogean not epigeal.



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**Fig. 21. *Ledebouria macowanii*.** **A**, habit  $\times 1$ ; **B**, lamina margin  $\times 300$ ; **C**, section through lamina  $\times 2.5$ ; **D**, bract  $\times 10$ ; **E**, apex of tepal  $\times 10$ ; **F**, flower  $\times 5$ ; **G**, tepal with stamen  $\times 10$ ; **H**, ovary lateral view  $\times 10$ ; **I**, ovary dorsal view  $\times 10$ . All from Venter 13413.

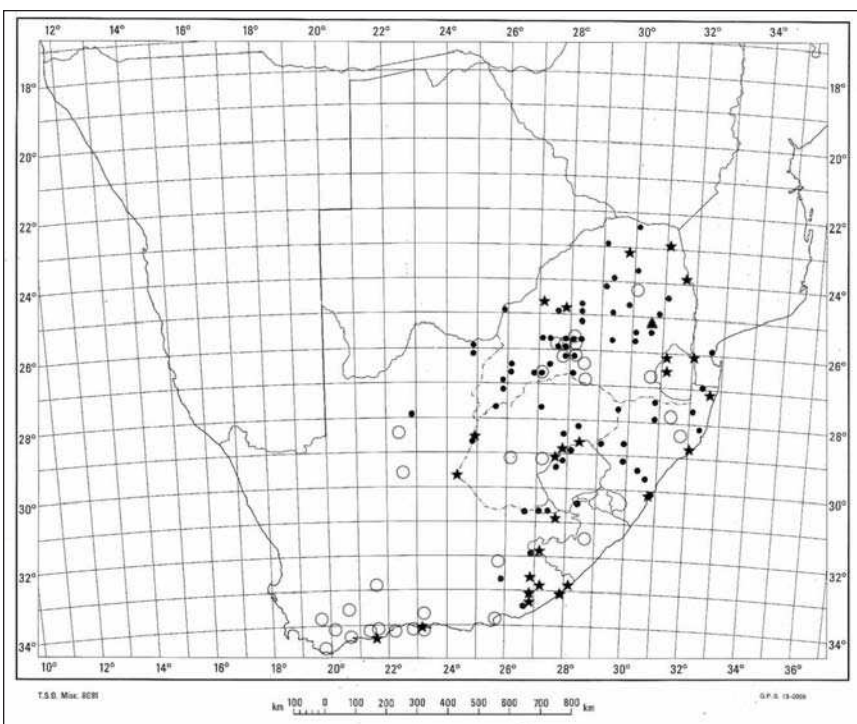


Fig. 22. Known distribution of *L. macowanii* (filled star), *L. marginata* (filled circle), *L. minima* (open circles) and *L. mokobulanensis* (filled triangle).

21. *Ledebouria marginata* (Baker) Jessop, Journ. S. Afr. Bot. 36(4):260 (1970).

*Scilla marginata* Baker, Bull. Herb. Boiss. ser. 2(4):1002 (1904). Type:

South Africa. Transvaal, Modderfontein, Conrath 703b (GRAZ!; PRE!, photo.; Z.).

*Scilla neglecta* Van der Merwe, Flower. Pl. S. Afr. 22:t.865 (1942). Type:

South Africa. Transvaal, Pretoria, Colbyn, Van der Merwe 2441 (PRE!, holo.).

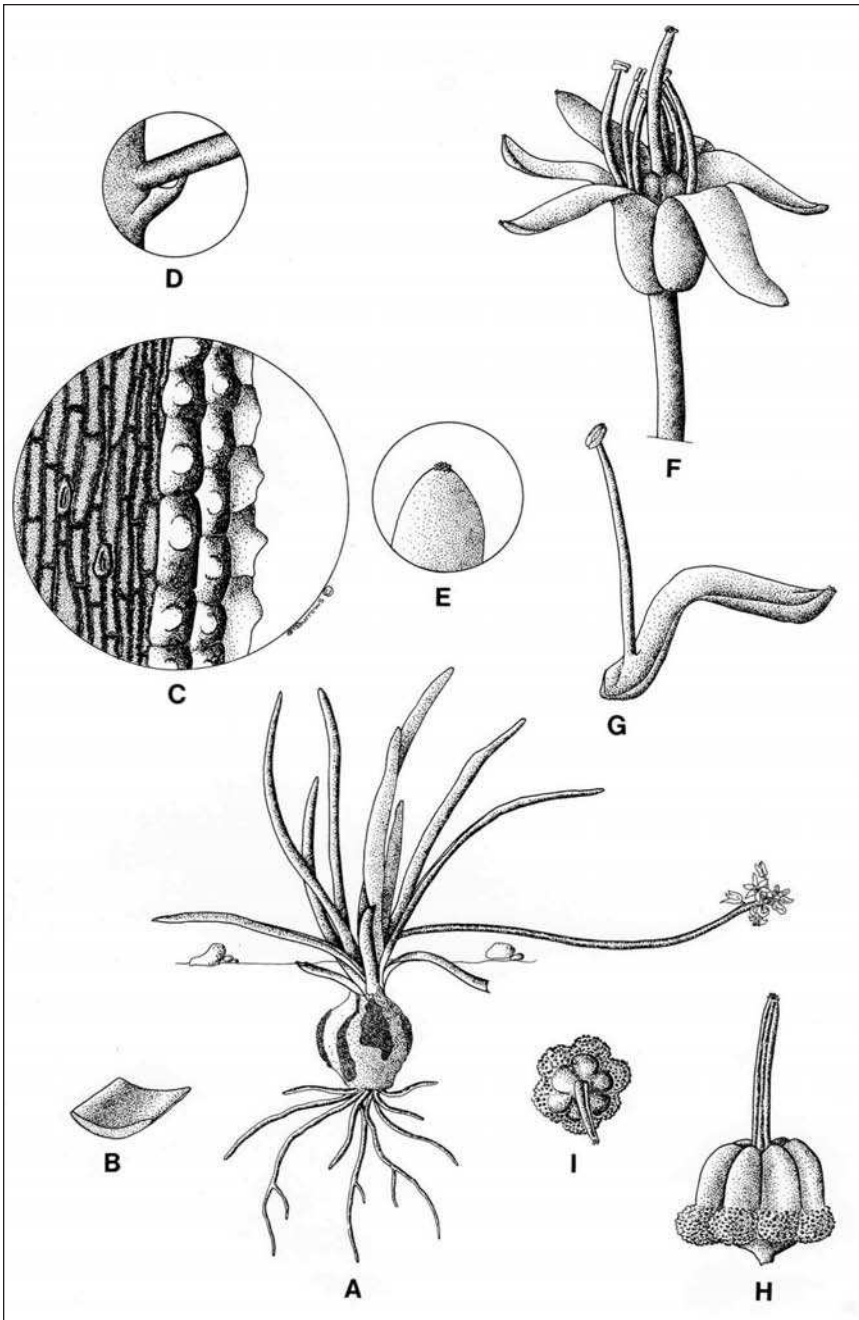
#### Diagnostic Features:

Leaves partly emerged at anthesis, leaves spirally twisted, venation prominent, with thick bundles of thread when torn making it nearly impossible to break even when dry, bracts with bracteoles and the seeds yellowish-brown.

#### Discussion:

*L. marginata* is closely related to *L. inquinata* and *L. glauca* but is easily distinguished by the tough glaucous leaves and many inflorescences.



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**Fig. 23. *Ledebouria minima*.** **A**, habit  $\times 1$ ; **B**, section through lamina  $\times 5$ ; **C**, lamina margin  $\times 300$ ; **D**, bract  $\times 10$ ; **E**, tepal apex  $\times 20$ ; **F**, flower  $\times 10$ ; **G**, tepal with stamen  $\times 10$ ; **H**, ovary lateral view  $\times 10$ ; **I**, ovary distal view  $\times 10$ . All from Venter 13404.

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22. *Ledebouria minima* (Baker) S. Venter, comb. nov. Type: **South Africa**.

Transvaal, on Macalisberg, Burke s.n. (K!, holo.; BOL!, drawing; PRE!, photo.).

*Scilla minima* Baker, Saund. Ref. Bot. 3(App.):6 (1870).

**Diagnostic Features:**

Linear leaves 24-36 × 2-3 mm with purplish cross bars at the base, inflorescence longer than the leaves. Smooth rachis, fleshy dentate bracts, stellate perianth and the base of the ovary lobes papillate.

**Discussion:**

*Ledebouria minima* is closely allied to *L. rupestris* (Van der Merwe) S. Venter. It differs in the glabrous, linear leaves and absence of bracteoles.

23. *Ledebouria mokobulanensis* Hankey & T.J. Edwards, S. Afr. Journ. Bot.

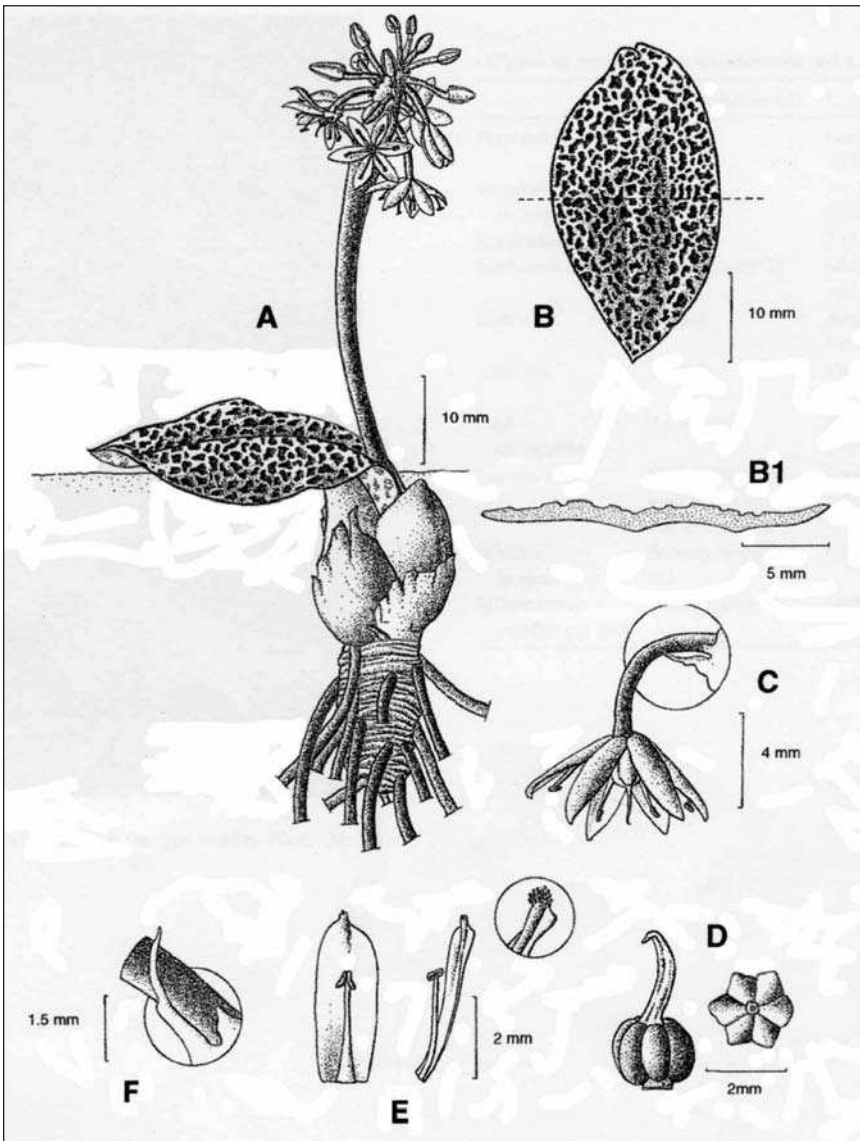
74:214-217 (2008). Type: **South Africa**. Mpumalanga. Farm Zomerplaatz 207 JT, Mokobulaan Plantations. Hankey & Mutshinyalo 1151 (PRE, holo.).

**Diagnostic Features:**

*L. mokobulanensis* can easily be distinguished from all other members of the genus by its conspicuously red-pitted upper leaf surface.

**Discussion:**

*L. mokobulanensis* can be distinguished from *L. galpinii* the only other *Ledebouria* species which produces leaves with a pitted upper surface, in having smaller, solitary (rarely 2), dull green, cordate leaves with red pits adaxially, as well as a solitary, erect inflorescence.

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**Fig. 24. *Ledebouria mokobulanensis*.** **A**, flowering plant; **B**, adaxial leaf surface; **B1**, transverse section of leaf; **C**, single flower; **D**, ovary in dorsal and lateral view; **E**, tepal and anther details (inset: tepal apex); **F**, bract and bracteoles. All from Hankey & Phungula 2067 (courtesy of South African Journal of Botany).

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**24. *Ledebouria monophylla* S. Venter, sp. nov., Type: South Africa.**

Mpumalanga, Graskop, Paradise Camp, Venter 13235 (PRE!, holo.; NU!; UNIN!).

Ad *L. cooperi* (Hook.f.) Jessop sed folio singulo, late ovato, adpresso; inflorescentia solitaria, erecta, pedunculo basi compresso et floribus stellaribus, lobis cucullatis distinctissima.

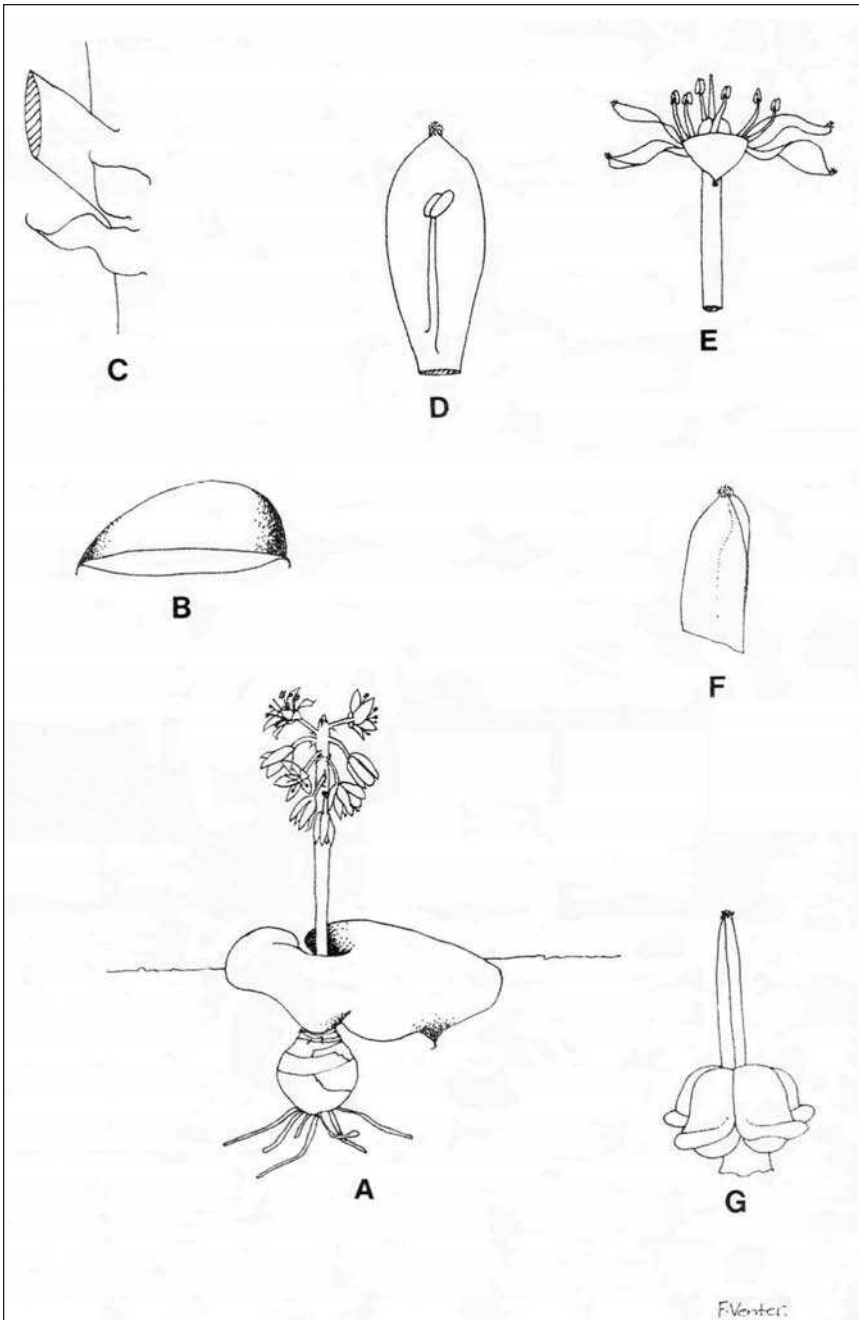
*Bulbs* 10-20 × 8-12 mm; dead bulb scales light brown, apices truncate, live bulb scales with threads when torn. *Leaf* 1(-2), sometimes partly emerged but usually fully developed at anthesis, appressed to ground, broadly ovate, 30-40 × 30-40 mm, without threads when torn, thickly fleshy to succulent, glossy green, immaculate, venation obscure; margin smooth, red; apex obtuse to acute. *Inflorescence* solitary, erect, globose, 10-15 × 15 mm, longer than the leaves; *scape* basally compressed, green spotted purple; *rachis* ridged, 10-30 mm long. *Bracts* fleshy, lanceolate to bifurcate, pink, with bracteoles. *Pedicels* spreading, 3-5 mm long, pink. *Perianth* 4 mm long, stellate, tepals oblong, 3.8-4.0 × 1.5 mm, apex obtuse, cucullate, pink to purple. *Stamens* spreading, filaments 1.5-4.0 mm long, base slightly flattened, upper part purple with lower part white, free; anthers 0.5 mm long, yellow. *Ovary* globose, 3-lobed, 1 × 2 mm, lobes depressed ovate, shoulders raised, stipe 0.25 × 0.25 mm. *Style* 1.5 mm long, triangular, purple; stigma above anthers. *Capsule* globose; base truncate. *Seed* drop-shaped, 1.5 mm long, surface strongly wrinkled, brown. *Flowering*: September to December with a peak from September to October (Fig. 25).

**Diagnostic Features:**

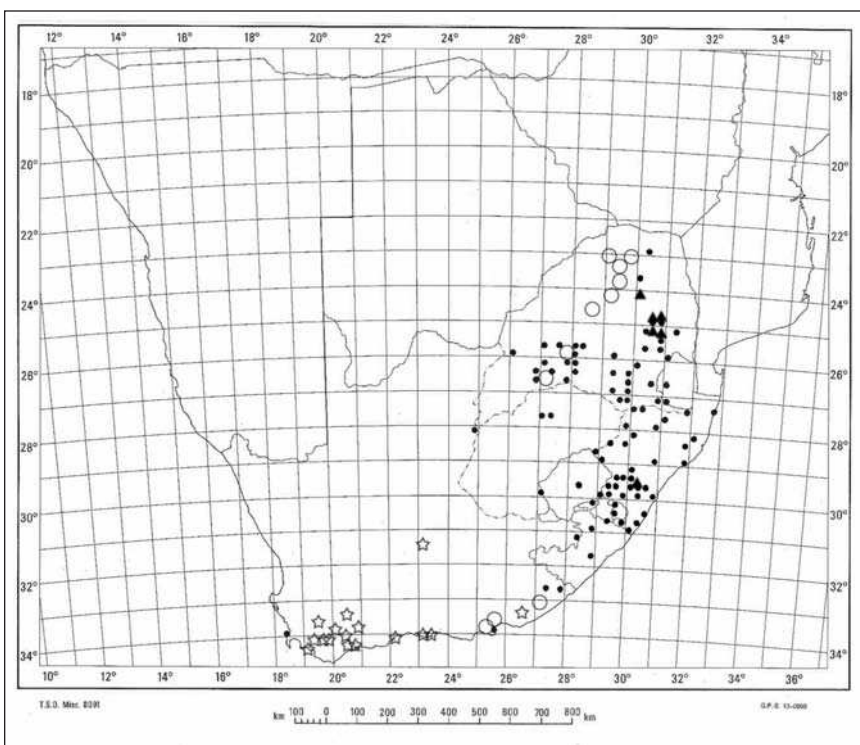
Characterized by the solitary, appressed fleshy leaf without markings or lines, the solitary inflorescence with depressed peduncle, globose raceme, stellate flowers and 3-lobed ovary.

**Discussion:**

*L. monophylla* is closely allied to the undescribed taxon discussed by Craib in *Herbertia* 60: 83 (2005-6).

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**Fig. 25. *Ledebouria monophylla*.** **A**, habit  $\times 1$ ; **B**, section through lamina  $\times 5$ ; **C**, bract with bracteole  $\times 10$ ; **D**, tepal with stamen  $\times 10$ ; **E**, flower  $\times 10$ ; **F**, apex of tepal  $\times 20$ ; **G**, gynoecium lateral view  $\times 10$ . All from Venter 13235.



**Fig. 26.** Known distribution of *L. monophylla* (filled triangle), *L. ovalifolia* (open stars), *L. ovatifolia* (filled circles) and *L. papillata* (open circle).



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25. *Ledebouria ovalifolia* (Schrad.) Jessop, Journ. S. Afr. Bot. 36(4):246 (1970).  
*Drimia ovalifolia* Schrad., Blumenb.: 28 (1827). Iconotype: Lodd. Bot. Cab. 3: t.278, sub *Drimia lanceaefolia* (1818).  
*Lachenalia reflexa* Andr., Bot. Rep. 5:t.299 (1803), nom. illegit., non Thunb.  
*Drimia lanceolata* Schrad., Blumenb.: 28 (1827). Iconotype: Andr. Bot. Rep. 5:t.299, sub *Lachenalia reflexa* Andr.(1803).  
*Drimia gawleri* Schrad., Blumenb.:30 (1827). Iconotype: In (1811)  
 Curtis's Bot. Mag. 33:t.1380, sub *Drimia lanceaefolia*, (1811).  
*Scilla lanceolata* (Schrad.) Baker, Saund. Ref. Bot. 3(Append.):14 (1870). nom.illegit., non Viviani (1830).  
*Scilla revoluta* (L.f.) Baker, sensu Baker in Flora Cap. 6:485 (1896).  
*Scilla ovalifolia* (Schrad.) C.A. Sm., Kew Bull.:245 (1930). Iconotype: Andrews Bot. Rep. 5:t.229 (1803).  
*Scilla doratophylla* C.A. Sm., Kew Bull.:245 (1930). Type: As for *Drimia lanceolata* Schrad.  
*Scilla genadendalensis* Von Poelln.,Port. Acta biol., ser.B, 1:212 (1945). Type: **South Africa**. Cape, Genadendal, Schlechter 10327 (PRE!, lecto.; BOL!; L!; Z!). The PRE specimen designated here as lecto type (Greuter et al 1988).

**Diagnostic Features:**

Live bulb scales without threads when torn, leaves partly emerged at anthesis and appressed to the ground but sometimes slightly spreading, without threads when torn, with short rows of papillae on the adaxial lamina surface, apices obtuse, inflorescence solitary and lax, rachis smooth, bracts semi-fleshy, without bracteoles, base of filament slightly swollen, anthers violet, ovary 3-lobed, apex shoulders raised.

**Discussion:**

*L. ovalifolia* resembles *L. remifolia* S. Venter but differs in the leaves partly emerged at anthesis, petiole not as well formed, solitary inflorescence, rachis smooth, no bracteoles and obtuse tepal apices.

26. *Ledebouria ovatifolia* (Baker) Jessop, Journ. S. Afr. Bot. 36(4):262 (1970).  
*Scilla ovatifolia* Baker, Saund. Ref. Bot. 3:t.183 (1870). Type: **South Africa**. Natal, Cooper s.n. (K!, holo.; PRE!, photo.).  
*Scilla lanceaefolia* (Jacq.) Baker var. *ovatifolia* Baker, Journ. Linn. Soc. 11(54):252 (1870). Iconotype: Saund. Ref. Bot. 3:t.183. "Cap. B. Spei, Cooper s.n.". *Scilla lanceaefolia* sensu Wood & Evans, Natal Plants 3(4):t.202 (1900), non *Lachenalia lanceaefolia* Jacq.  
*Scilla guttata* C.A. Sm., Kew Bull.:243 (1930). Type: **South Africa**. Natal, Durban Div., Cooper s.n. (K!, holo.).  
*Scilla cicatricosa* C.A. Sm., Kew Bull.:246 (1930). Nom. nov. only.  
*Scilla climacocarpha* C.A. Sm., Kew Bull.:249 (1930). Type: **South Africa**. Orange Free State, Bethlehem, Phillips 3068 (PRE!, holo.).  
*Scilla albomarginata* Van der Merwe, Flower. Pl. S. Afr. 24:t.947 (1944). Type: **South Africa**. Natal, Umzinto, Van der Merwe 2669 (PRE!, holo.).  
*Scilla elevans* Van der Merwe, Flower. Pl. S. Afr. 24:t.948 (1944). Type: **South Africa**. Natal, Vryheid, Van der Merwe 2677 (PRE!, holo.).  
*Scilla collina* Hutch., Bot. in S. Afr.:344 (1946). Type: **South Africa**. Transvaal, Soutpansberg, Klein Australe, Smuts & Gillett 4186 (K!, holo.; PRE!, photo.).

#### Diagnostic Features:

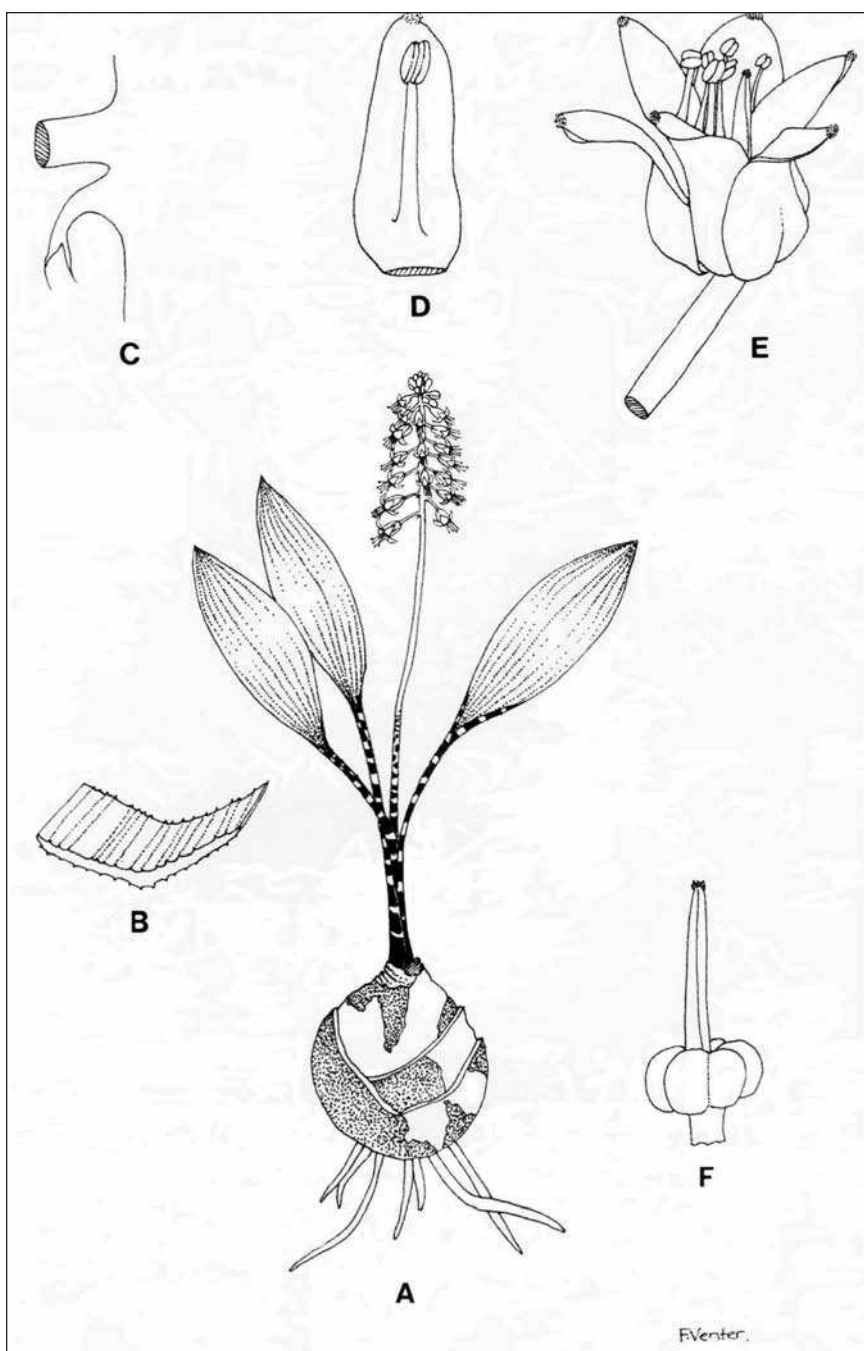
The brown to purple bulb scales with copious threads when torn, appressed leaves with threads when torn, flaccid inflorescences that are longer than the leaves, basally compressed scape and the ridged rachis.

#### Discussion:

*L. ovatifolia* is closely related to *L. luteola* but differs in the truncate apices of the bulb scales and the partly emerged, ovate to deltate, mostly humifuse leaves.

27. *Ledebouria papillata* S. Venter, sp.nov., Type: **South Africa**. Limpopo Province, Polokwane (Pietersburg), Venter 13186 (PRE!, holo.; NU!; UNIN!).

Ad *L. cooperi* (Hook.f.) Jessop affinis sed squamis ad apicem truncatis; petiolo purpureo fasciato; inflorescentiis erectis, pedunculo pappilato; ovario stipitato, stipite 0.5 mm longo; ovario dorsaliter lobato differt.

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**Fig. 27. *Ledebouria papillata*.** A, habit  $\times 1$ ; B, section through leaf  $\times 3$ ; C, bract  $\times 10$ ; D, tepal with stamen  $\times 10$ ; E, flower  $\times 10$ ; F, gynoecium lateral view  $\times 10$ . All from Venter 13008.

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*Bulb* 15-30 × 8-20 mm; dead bulb scales light brown, membranous, apices truncate, live bulb scales without threads when torn, neck 3-27 × 3-7 mm; basal stem 5-15 mm long. *Cataphylls* 2, reaching ground level. *Leaves* fully developed at anthesis, spreading, linear-lanceolate to oblanceolate, 30-90 × 4-10 mm, with few threads when torn, adaxial surface glossy dark green, abaxial surface dull purplish green with rows of longitudinal papillae, prominent dark purple cross bars at base, venation prominent; margins papillate; leaf base petiolate, canaliculate; apex acute to acuminate. *Inflorescences* 1-2, 20-60 × 10-20 mm, erect, longer than the leaves; *scape* terete at base, spotted and striped purple, longitudinally papillate, *rachis* ridged, 50-120 mm long. *Bracts* fleshy, 0.5 × 0.25 mm, oblong to bifurcate, pink, white or green without bracteoles. *Pedicels* spreading horizontally, 2.5-5.0 mm long, pink. *Perianth* 2.0-3.5 mm long, tepals reflexed, oblong, 3.0-3.5 × 1.0-1.5 mm, apex obtuse, thinly cucullate, pink to purple with a green keel. *Stamens* erect, filaments 3 mm long, maroon, epitepalous; anthers 0.5 mm long, violet. *Ovary* globose, 6-lobed, 1.5 × 2.5 mm, lobes depressed ovate, apex shoulders raised, distal lobes present. *Style* 3.5 mm long, purple; stigma equal height to anthers; stipe 0.5 × 0.5 mm. *Capsule* globose; base tapering. *Seed* globose, 2 mm long, surface strongly wrinkled, brown. *Flowering*: October to January with a peak in November (Fig. 27).

**Diagnostic Features:**

Prominent neck to the bulb, leaves 2-4 and fully developed at anthesis, 2 cataphylls reaching ground level, leaves glossy dark green, abaxial surface dull purplish green with rows of longitudinal papillae, base of lamina nearly petiolate with prominent dark purple cross-bars at base, venation prominent, 1-2 erect dense inflorescences, scape terete at base, green, spotted and striped purple, longitudinally papillate, rachis ridged, bracteoles absent, perianth small, 2.0-3.5 mm long with violet anthers.

**Discussion:**

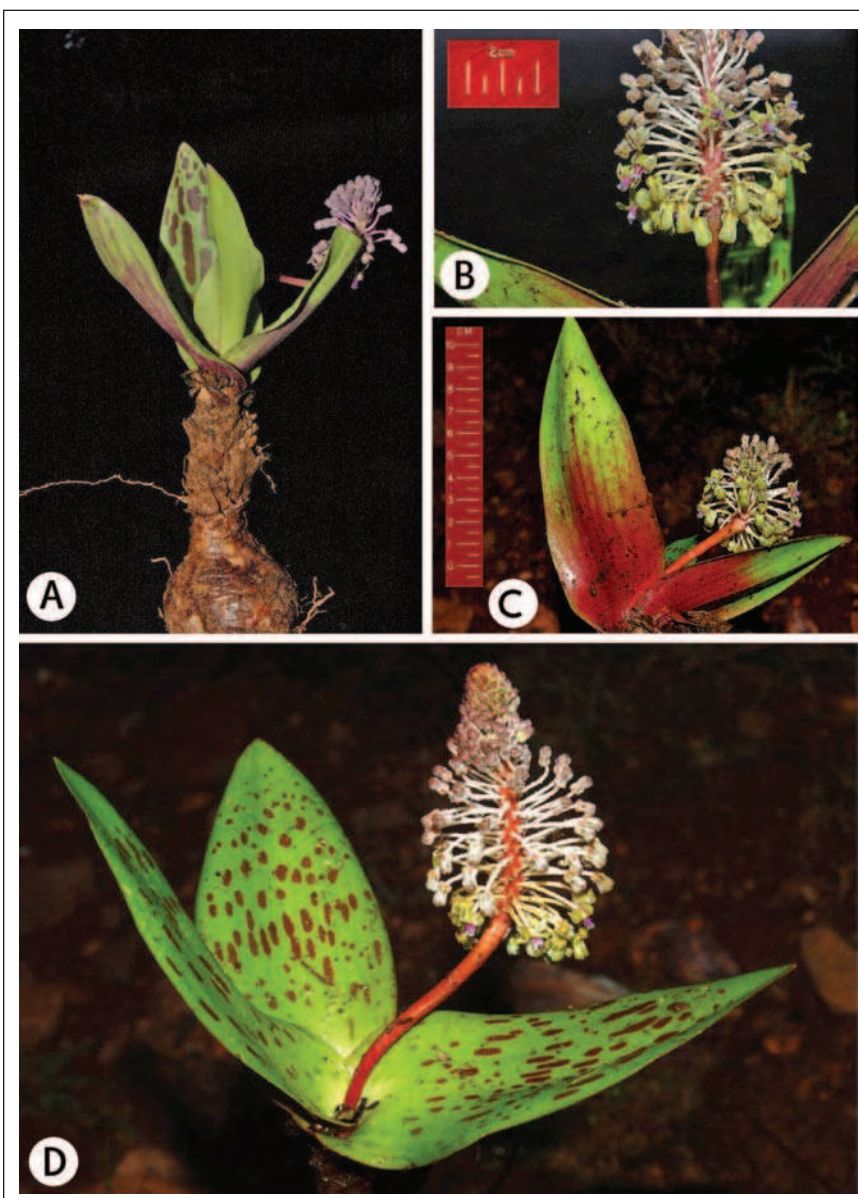
*L. papillata* is closely related to *L. galpinii* but differs in having longitudinal rows of papillae on the adaxial leaf surface, purple cross bars on the petiole, erect inflorescences, and papillate peduncles.

**28. *Ledebouria pardalota* S. Venter, sp. nov., Type: South Africa.**

Mpumalanga Province, Barberton area, Angle Station track. 03.xi.2007.  
Lötter & Turpin 1315 (PRE, holo!).

*L. revolutae* affinis sed collo bulbis prominente exhibente, foliis distractis fibras carentibus, inflorescentias 1, (rarius 2) producente, bracteolas carente, filamentos 5 mm longis et ovario dorsaliter lobato satis differt.

*Bulbs* (26-) 33-80 × (25-)30-54 mm; dead bulb scales dark brown, membranous, apices attenuate, live bulb scales without threads when torn, purplish inside; neck prominent, 20-30 × 12-17 mm. *Leaves* fully developed at anthesis, 3-5, spreading, lanceolate to oblong, 68-150 × (26-)36-45 mm, without threads when torn; adaxial surface pea green with prominent pruinose blotches and spots, venation obscure; margin smooth and revolute; abaxial surface prominently pruinose in the lower half to wholly pruinose; leaf base shallowly canaliculated; apex obtuse to acute. *Inflorescence* 1(-2), longer than the leaves, flaccid, *scape* 50-65 mm long, pruinose, compressed at base, glabrous; *rachis* ridged, raceme dense, cylindric, oblong, 46-166 × 30-43 mm, 50-120-flowered. *Bracts* without bracteoles, fleshy, 1.03-1.48 × 1.0-1.34 mm, deltoid, pink to purple. *Pedicels* spreading horizontally, (8-)11.6-21.0 mm long, white to light pink aging darker pink. *Perianth* 4.16-5.02 mm long, tepals recurved, oblong, 4.25-5.68 × 2.0-2.07 mm, equal, apex obtuse to slightly acute, weakly cucullate, green with a greenish purple keel. *Stamens* erect, filaments 2.4-3.6 mm long, dark pink to purple, epipetalous; anthers 0.85-0.97 mm long, pale violet. *Ovary* ovoid, 6-lobed, 0.8-1.0 × 1.5-1.7 mm, glabrous, lobes narrowly transversely oblong, apex shoulders raised, dorsal lobes prominent and papillate. *Style* 0.95-0.98(-1.5) mm long, glabrous, purple; stigma equal height than anthers; stipe 0.2 × 0.2 mm. *Flowering*: December to January (Fig. 28).



**Fig. 28. *Ledebouria pardalotus*.** **A**, plant showing the prominent neck to the bulb; **B**, inflorescence showing the ridged rachis and the prominent revolute leaf margin; **C**, the pruinose abaxial leaf surface; **D**, growth habit showing clearly the pruinose spots on the pea-green leaves and the pruinose scape. All from Lötter & Turpin 1315 (Photos by M. Lötter).

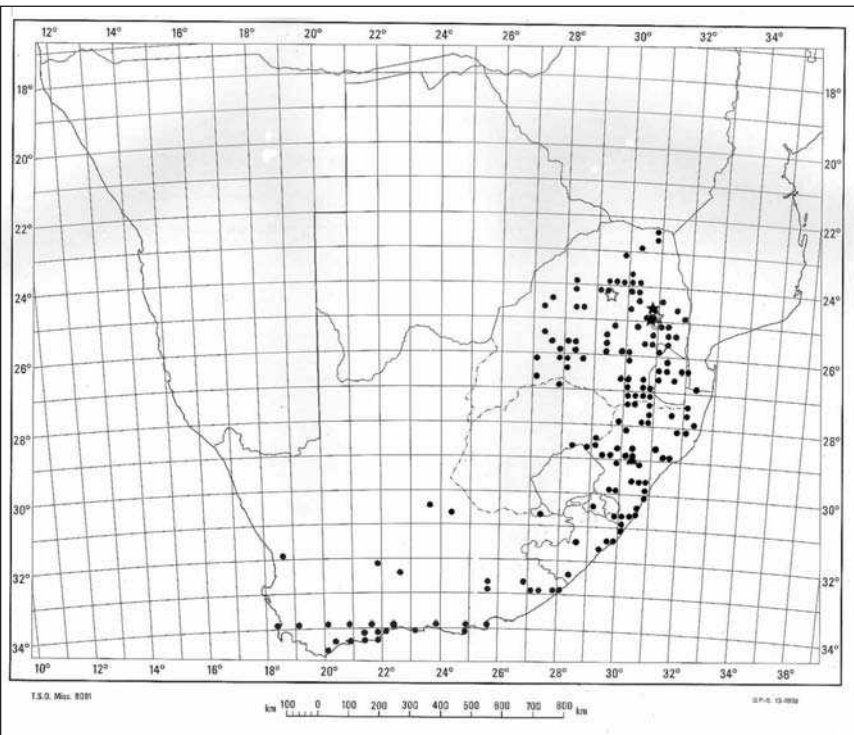


SYNOPSIS OF THE GENUS *LEDEBOURIA* ROTH (HYACINTHACEAE) IN SOUTH AFRICA**Diagnostic Features:**

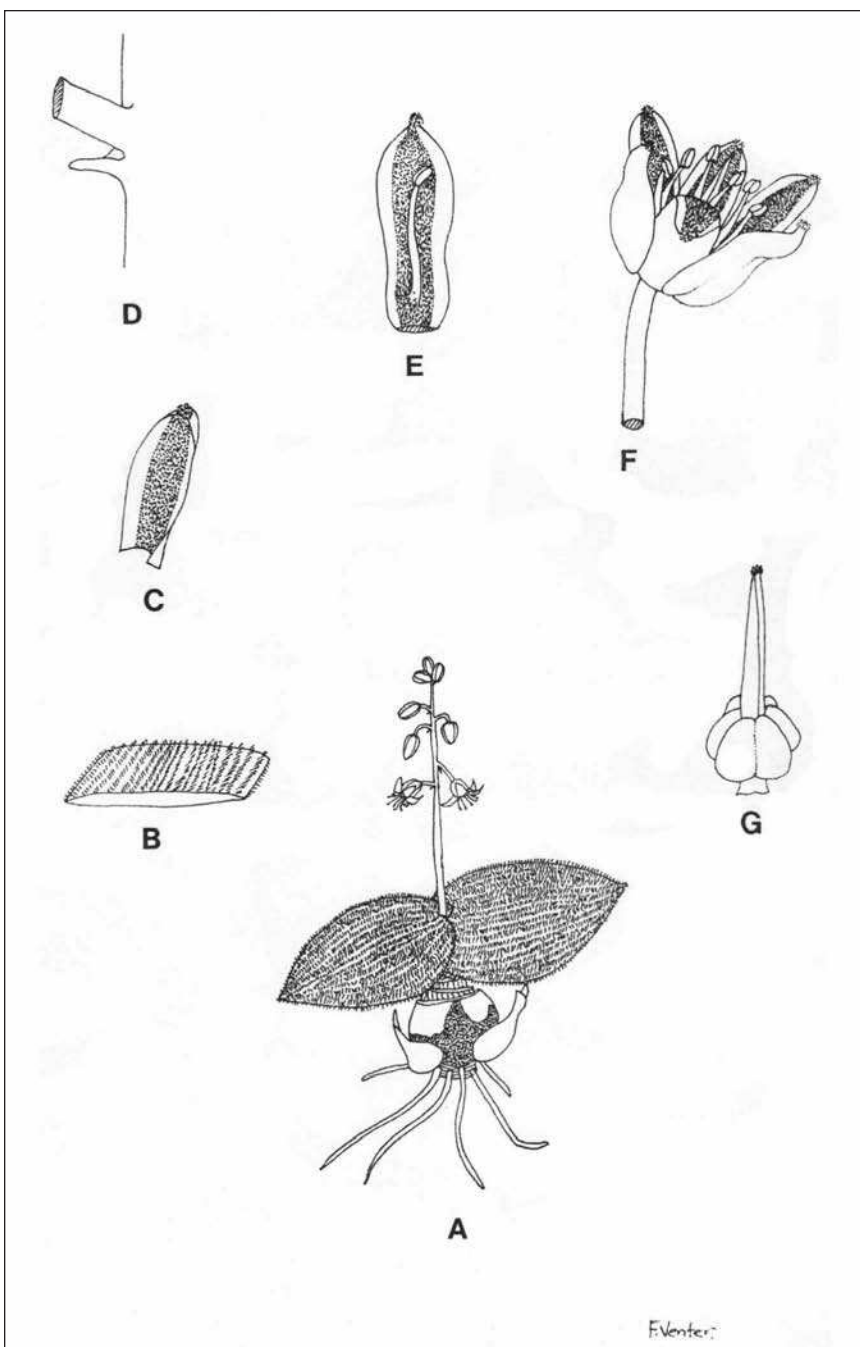
The brown dead bulb scales, prominent neck to the bulb, adaxial leaf surface glabrous, pea-green with pruinose blotches and spots, abaxial surface pruinose, dense flaccid inflorescence with long pedicels, green tepals with purplish keel and the papillate dorsal lobes of the ovary.

**Discussion:**

*Ledebouria pardalota* is related to *L. floribunda* but differs in the leaves lacking threads when torn, revolute leaf margin, inflorescence longer than the leaves, fleshy flower bracts without bracteoles, ovoid ovary with raised apex shoulders and papillate dorsal lobes. From *L. revoluta* it differs in the bulb scales and leaves with no threads when torn, pruinose abaxial leaf surface 1(-2) inflorescences, scape compressed at base, fleshy flower bracts and papillate basal lobes.



**Fig. 29.** Known distribution of *L. pardalota* (open circle), *L. parvifolia* (open stars), *L. pustulata* (filled triangle), *L. remifolia* (closed stars), *L. revoluta* (filled circles) and *L. rupestris* (double circle).



**Fig. 30. *Ledebouria parvifolia*.** **A**, habit  $\times 2$ ; **B**, section through lamina  $\times 2$ ; **C**, tepal  $\times 5$ ; **D**, bract  $\times 10$ ; **E**, tepal with stamen  $\times 10$ ; **F**, flower  $\times 5$ ; **G**, ovary lateral view  $\times 10$ . Drawn from Venter *s.n.*

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29. *Ledebouria parvifolia* S. Venter, Bothalia 28 (2):180 (1998). Type: South Africa. Transvaal, Graskop, near Lisbon Falls, farm Lisbon 531 KT, Venter s.n. (PRE!, holo.).

**Diagnostic Features:**

Live bulb scales without threads when torn, bulblets present on basal stem, single cataphyll exerted above ground, leaves humifuse, with rows of hairs on adaxial lamina surface, inflorescence solitary, erect and lax, scape purple, rachis smooth, bracts fleshy and without bracteoles and the 3-lobed ovary.

**Discussion:**

*L. parvifolia* is related to *L. cooperi* but differs in its humifuse leaves with longitudinal rows of hair-like papillae, solitary, erect, lax inflorescence and 3-lobed ovary.

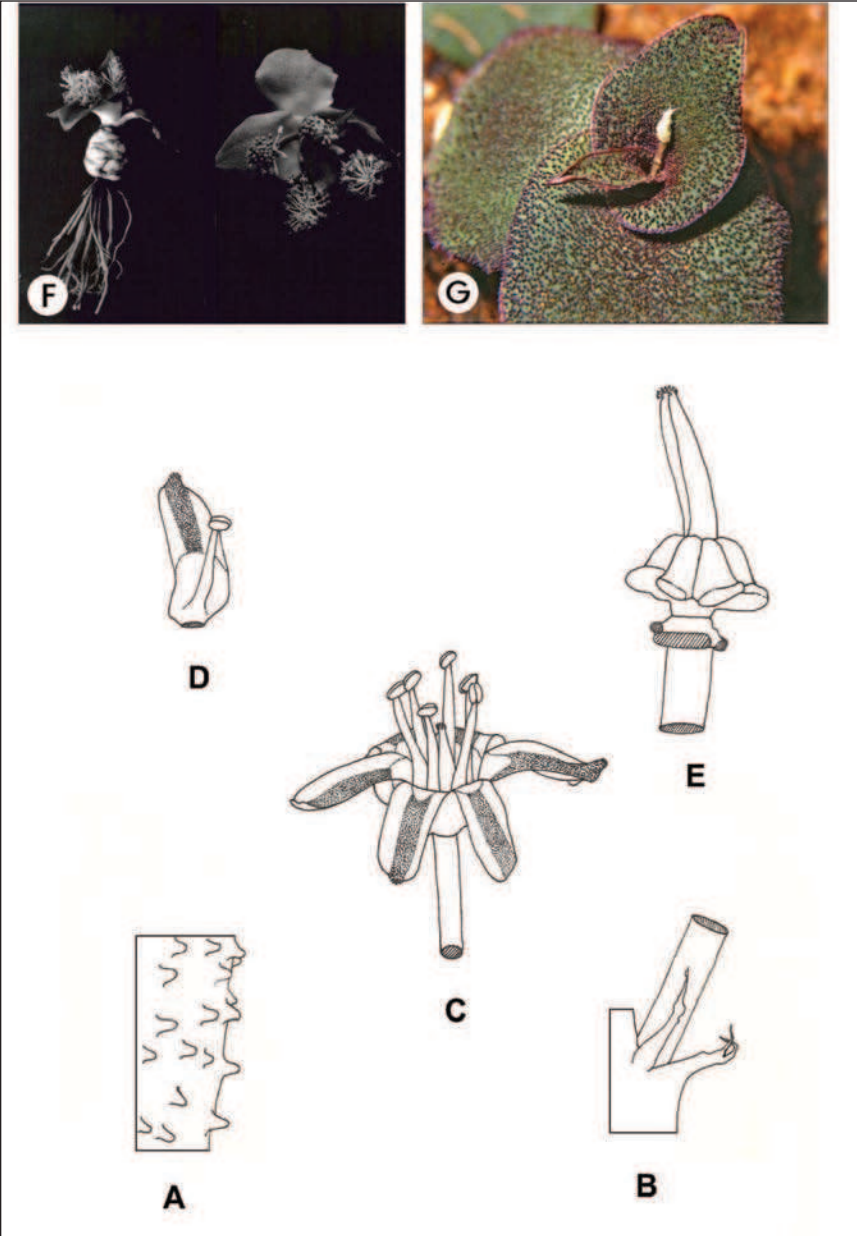
30. *Ledebouria pustulata* S. Venter, sp. nov., Type: South Africa.

KwaZulu/Natal Province, Muden, near the Mdumbeni River Bridge at Mt. Moriah, altitude 1200 m. 06.ii.1990. Venter 13463 (PRE!, holo.).

*L. ovatifoliam* (Bak.) Jessop in mentem vocat, sed pagina superiore foliorum dense papillis ad 0.5–1.0 longis obiecta, ovario valde parvo (0.5–0.8 × 0.6–1.0 mm) distinguitur.

*Bulb* 40–60 × 30–50 mm, elliptic to ovate, dead bulb scales brown, apices attenuate, with copious threads when torn, white inside, truncate, tightly appressed. *Leaves* fully emerged at anthesis, 4–6, humifuse to slightly spreading, ovate to broadly ovate, (40–)50–100 × (35–)40–60(–90) mm, with threads when torn, dull green to purplish green, adaxial surface covered in prominent papillae 0.5–1.0 mm high, abaxial surface glabrous; margin white and slightly wavy; leaf base shallowly canaliculated, apex acute. *Inflorescences* 1–4, flaccid, 30–70-flowered, shorter than the leaves; *peduncle* glabrous, flattened at base, green fused purple to purple, 20–40(–55) mm long; *rachis* longitudinally ridged; *raceme* dense, oblong, 30–40 × (30–)40–50 mm; *bracts* and bracteoles always present, membranous, 1.0–2.0 × 0.25–0.4 mm, linear, white. *Pedicels* spreading, 10–15 mm long, light pink to pink. *Tepals* strongly recurved, subequal, oblong, 6–8 × 1.5–2.0 mm, light greenish pink, keel green; apex obtuse and cucullate. *Stamens* erect, 2–3 mm long, filaments pink to maroon, epipetalous, anthers 0.9–1.0 mm long, violet. *Ovary* 6–

lobed,  $0.5-0.8 \times 0.6-1.0$  mm, lobes narrowly transversely oblong, apex shoulders present, basal lobes present, smooth; stipe  $0.15-0.5$  mm long; *style*  $1.5-2.0$  mm long, terete, glabrous, maroon, stigma below anthers (Fig. 31).



**Fig. 31. *Ledebouria pustulata*.** **A**, side and top view of the type plant showing the attenuate apices of the bulb scales; **B**, the heavily papillate adaxial surface of the leaves; **C**, flower; **D**, tepal with stamen; **E**, ovary, side view; **F**, papillae of the leaf; **G**, bract and bracteole. All from Venter 13463.

SYNOPSIS OF THE GENUS *LEDEBOURIA* ROTH (HYACINTHACEAE) IN SOUTH AFRICA**Diagnostic Features:**

The truncate bulb scales, humifuse leaves with dense papillae on the adaxial surface, inflorescences shorter than the leaves, bracts and bracteoles always present, rachis ridged, tepals strongly recurved, ovary apex shoulders present, and the basal lobes glabrous.

**Discussion:**

*Ledebouria pustulata* is related to *L. ovatifolia* but differs in the adaxial lamina surface densely covered in 0.5-1.0 mm high papillae and the much smaller ovary (0.5-0.8 × 0.6-1.0 mm compared to 0.5-0.8 × 0.6-1.0 mm).

**31. *Ledebouria remifolia* S. Venter, nom. nov.**

*Scilla petiolata* Van der Merwe, Flower. Pl. S. Afr. 21:t.832 (1941). Type:

**South Africa.** Transvaal, North of Graskop, Strydom s.n. sub PRE 26397 (PRE!, holo.; iso!).

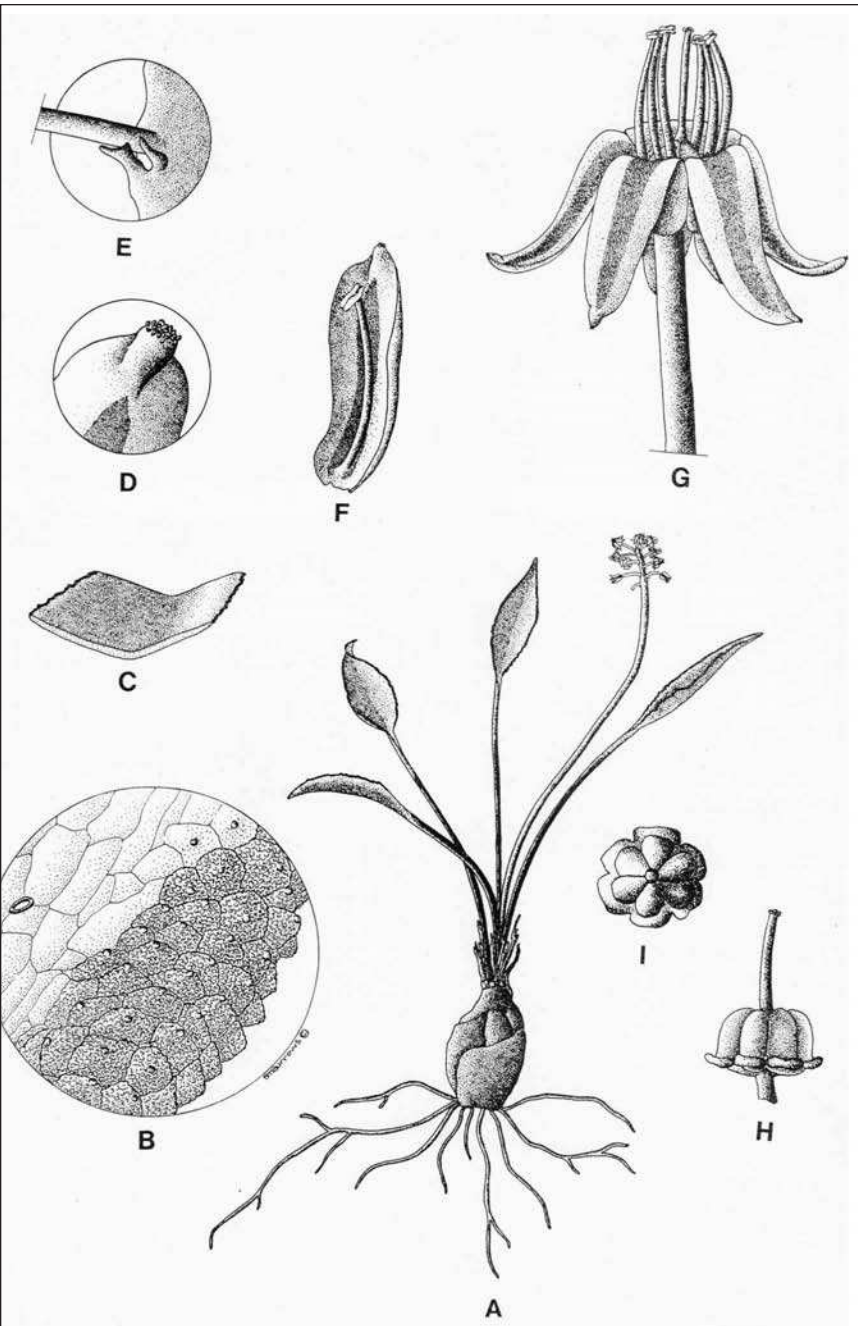
The epithet '*petiolata*' is already in use by Manning and Goldblatt (2004) for =*Ledebouria petiolata* (*Drimiopsis maculata*).

**Diagnostic Features:**

Leaf with a prominent petiole up to 30 mm long and thickened lamina margins, ridged rachis and fleshy bracts and bracteoles.

**Discussion:**

Cannot be confused with any other *Ledebouria* species. The long, thin petiole is unique in the genus.



**Fig. 32. *Ledebouria remifolia*.** **A**, habit  $\times 1$ ; **B**, lamina margin  $\times 300$ ; **C**, section through lamina  $\times 5$ ; **D**, apex of tepal  $\times 20$ ; **E**, bract with bracteole  $\times 10$ ; **F**, tepal with stamen  $\times 10$ ; **G**, flower  $\times 10$ ; **H**, ovary lateral view  $\times 10$ ; **I**, ovary distal view  $\times 10$ . All from Middleton **s.n.**



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32. *Ledebouria revoluta* (L.f.) Jessop in Journ. S. Afr. Bot. 36(4):255 (1970).  
*Hyacinthus revolutus* L.f., Suppl. Plant.:204 (1781). Type: **South Africa**.  
 Cape, Cap. bonae Spei, Thunberg s.n. (UPS, holo.; BOL & PRE!, on  
 Herb. Thunb. Microfiche no. 8508).  
*Lachenalia lanceaefolia* Jacq., Icones Pl. Rar. 2:t.402 (1794). Iconotype:  
 Jacquin in Icones Pl. Rar. 2:t.402 (1794).  
*Phalangium revolutum* (L.f.) Pers., Syn. Pl. 1:367 (1805). Type: **South  
 Africa**. Cap. bonae Spei, Thunberg s.n. (UPS, holo.; BOL & PRE!,  
 on Herb. Thunb. Microfiche no. 8508).  
*Lachenalia lanceaefolia* Sims var. *maculata* Tratt., Archiv der  
 Gawchskunde 2:132, t.168 (1814). Iconotype: Tratt. in Archiv der  
 Gewchskunde 2:t.168 (1814).  
*Scilla maculata* Schrank, Pl. Rar. Hort. Acad., Monac. 2:fol.100, t.100.  
 "Promontium Bonae Spei" (1820). Iconotype: As for *Drimia  
 lanceaefolia* Lodd. var. *longipedunculata* Schrader.  
*Ledebouria hyacinthina* Roth, Nov. Pl. sp. Ind. Or.:195 (1821). Type:  
**India**. Heyne s.n. (K, holo.).  
*Drimia acuminata* Lodd., Bot. Cab.:t.1041 (1825). Iconotype: Lodd. Bot.  
 Cab. : t.1041. "Cape of Good Hope" (1825).  
*Drimia lanceaefolia* Lodd. var. *longipedunculata* Schrader, Blumenb.:30  
 (1827). Iconotype: Pl. Rar. Hort. Acad., Monac. 2:fol.100, t.100  
 "Promontium Bonae Spei" (1819).  
*Eratobotrys bifolia* A. Rich., Tent. Fl. Abyss. 2:326 (1850). Type: **Ethiopia**.  
 Walcha Plateau, Schimper 1622 (P, holo., K, iso.).  
*Scilla indica* Baker, Saunders Refug. Bot. 3, Append. 12 (1870), nom. ill  
 git. Type: same as *Ledebouria hyacinthina*.  
*Scilla revoluta* (L.f.) Baker, Saund. Ref. Bot. 3(app.):6(1870). Type: **South  
 Africa**. Cape, Caledon Div., on Donker Hoek mountain, Burchell  
 7982 (K, holo.).  
*Scilla richardiana* Baker, Saunders Refug. Bot. 3, Appen. 11 (1870). Based  
 on *Eratobotrys bifolia* A. Rich. fide Stedje & Thulin (1995).  
*Scilla spathulata* Baker, Saund. Ref. Bot. 3:t.187 (1870). Iconotype:  
 Saund. Ref. Bot. 3:t.187, "South Africa. Cape of Good Hope,  
 Cooper s.n." (1870).  
*Scilla livida* Baker, Gdnrs' Chron. 20:166 (1883). Type: **South Africa**.  
 Cape of Good Hope, Hort. F. Horsman & Co. (K!, holo.; PRE!,  
 photo.; BOL!, drawing).

- Scilla polyantha* Baker var. *angustifolia* Baker, Flora Cap. 6:488 (1896).  
Type: **South Africa**. Transvaal, Saddleback Mountain, Barberton, Galpin 1096 (PRE!, holo.).
- Drimia brevifolia* Baker, F.T.A. 7:527 (1898). Type: **Somalia/Ethiopia** border. Near The River Daua, at Dolo. Riva 1251 (B, holo., FT, iso.).
- Scilla neumannii* Engl., E.J. 32:95 (1902). Type: **Ethiopia**. Gara Mulata. Ellenbeck 490 (B, holo.).
- Scilla moschata* Schnl., Rec. Albany Mus. 3:60 (1914). Type: **South Africa**. Cape, Stutterheim, Rogers 12786 (GRA!, holo.; PRE!, photo.).
- Scilla hyacinthina* (Roth) Macbr., Contr. Gray Herb. 56:14 (1918).
- Scilla chiovenda* Cufod., Miss. Biol. Borana, Racc. Bot.:320 (1939). Types: **Ethiopia**. Neghelle. Cufodontis 170, 199 & 229 (FT, syn.).
- Scilla carnosula* Van der Merwe, Flower. Pl. S. Afr. 24:t.958 (1944). Type: **South Africa**. Natal, near Greytown, Van der Merwe 2592 (PRE!, holo.).

#### Diagnostic Features:

Live bulb scales with threads when torn, leaves fully developed at anthesis, with threads when torn, inflorescences 4–10, dense, flaccid with more than 30 flowers per raceme, rachis ridged, bracts and bracteoles membranous, anthers pale yellow, ovary 6-lobed, distal lobes present and the seeds brown.

#### Discussion:

*L. revoluta* is closely related to *L. hypoxidioides* but *L. hypoxidioides* is easily separated from *L. revoluta* in the hairy leaves.

33. *Ledebouria rupestris* (Van der Merwe) S. Venter, comb. nov., Type: **South Africa**. Transvaal, near Mac Mac and Sabie. Van der Merwe 1586 (PRE!, holo.).

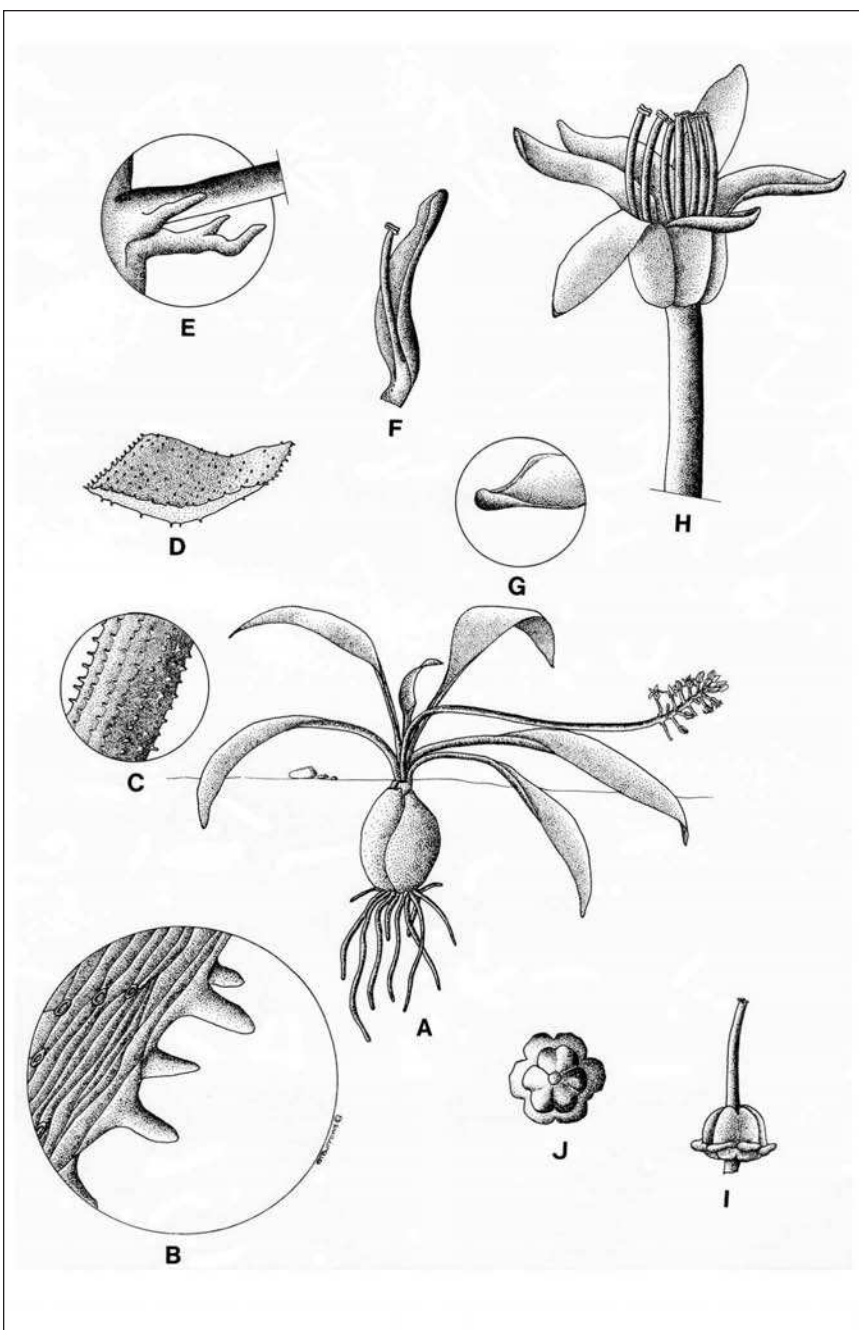
*Scilla rupestris* Van der Merwe, Flower. Pl. S. Afr. 21:t.828 (1941).

#### Diagnostic features:

The petiolate leaves with adaxial asperities easily distinguish *L. rupestris*.

#### Discussion:

*L. rupestris* is closely related to *L. minima* but differs in the leaves and bulb scales that lack threads when torn, leaves are monochromatic, racemes lax with a smooth rachis, bracts fleshy and the stellate flowers with acute tepals.

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**Fig. 33. *Ledebouria rupestris*.** **A**, habit  $\times 2$ ; **B**, lamina margin  $\times 300$ ; **C**, section of the peduncle  $\times 10$ ; **D**, section through lamina  $\times 5$ ; **E**, bract with bracteole  $\times 10$ ; **F**, tepal with stamen  $\times 10$ ; **G**, tepal apex  $\times 20$ ; **H**, flower  $\times 10$ ; **I**, ovary lateral view  $\times 10$ ; **J**, ovary distal view  $\times 10$ . All from Venter 13250.

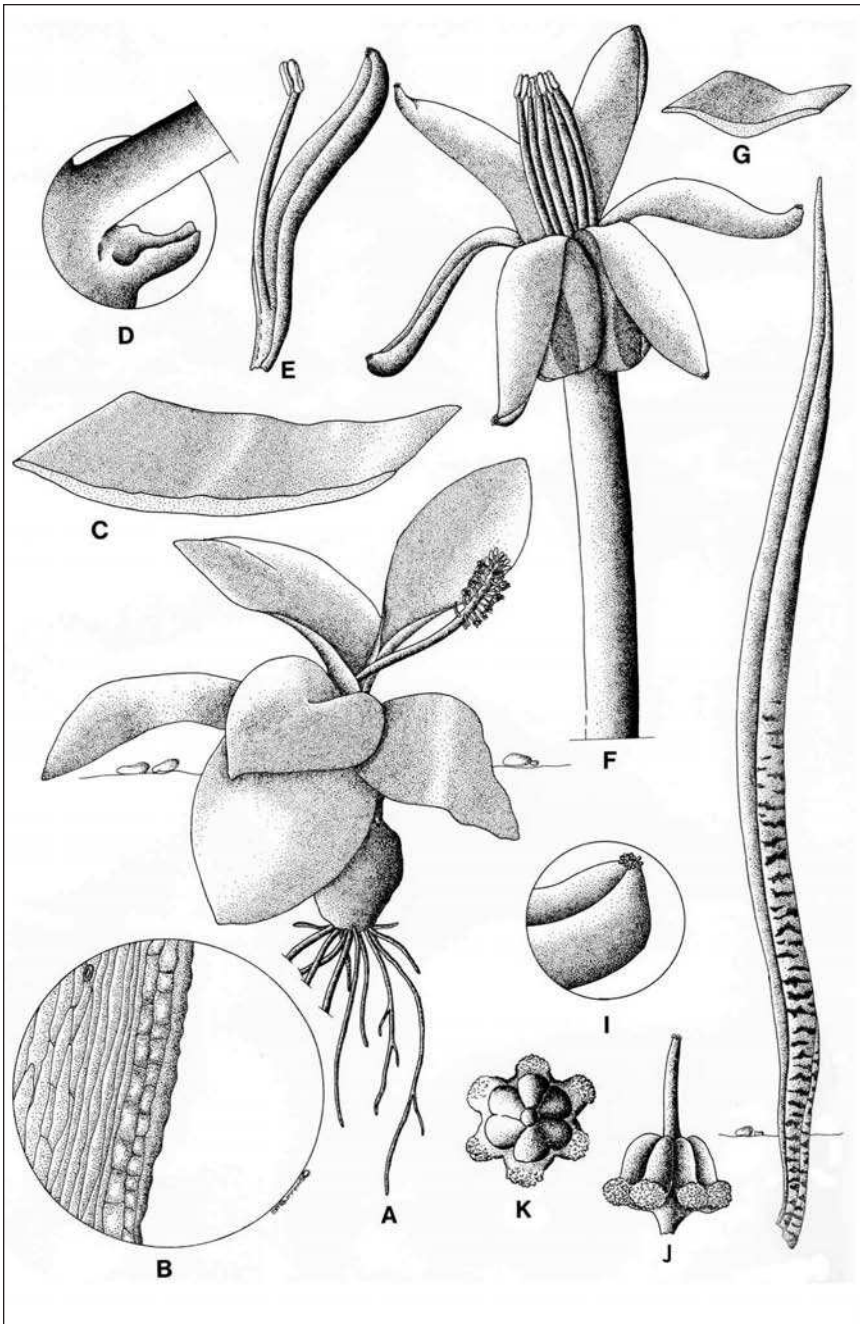
34. *Ledebouria sandersonii* (Baker) S. Venter & T.J. Edwards, Bothalia 33 (1):50 (2003). Type: **South Africa**. Transvaal, s. loc., Sanderson s.n. (K!, holo.; PRE!, photo).
- Scilla sandersonii* Baker, Saund. Ref. Bot. 3 (App.):5 (1870). Type: Same as for *L.sandersonii*.
- Scilla baurii* Baker, Flora Cap. 6:484 (1896). Type: **South Africa**. Cape, Tembuland, Bazeia Mountain. Bauer 550 (K!, holo.; PRE!, photo.; SAM!).
- Scilla tysonii* Baker, Flora Cap. 6:484 (1896). Type: **South Africa**. Cape, Griqualand East. Tyson s.n. (K!, holo.; BOL! & GRA!, drawing).
- Scilla oostachys* Baker, Flora Cap. 6:487 (1896). Type: **South Africa**. Natal, Upper Umkomaas. Wood 4627 (K!, holo.; NH!; PRE!, photo.; BOL!, drawing).
- Scilla diphylla* Baker, Flora Cap. 6:489 (1896). Type: **South Africa**. Transvaal, Barberton, Saddleback Range. Galpin 1182 (K!, holo.; BOL!; GRA!; NH!; PRE!; SAM!).
- Scilla bella* Markötter, Ann. Univ. Stell. 8 (Sec. A No. 1.):13 (1930). Type: **South Africa**. Natal, Olivier's Hoek Pass. Thode s.n. sub STE 3372 (STE!, holo.; PRE!, photo.).

#### Diagnostic Features:

Live bulb scales loosely arranged and without threads when torn, leaves fully developed at anthesis, abaxial lamina surface purple, venation obscure, rachis and scape smooth, bracts fleshy and dentate, tepal apices acute, ovary six-lobed with the apex tapering into the style and the base of the lobes with papillate nectaries.

#### Discussion:

*Ledebouria sandersonii* is related to *L. apertiflora* and *L. ensifolia* in having bulb scales without threads when torn, having fleshy bracts and markedly acute tepal apices. It differs however in the thin fleshy roots, loosely arranged live bulb scales, ovate to lanceolate leaves and dense oblong raceme.

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**Fig. 34. *Ledebouria sandersonii*.** **A**, habit  $\times 1$ ; **B**, lamina margin  $\times 300$ ; **C**, section through lamina  $\times 2$ ; **D**, bract  $\times 10$ ; **E**, tepal with stamen  $\times 10$ ; **F**, flower  $\times 10$ ; **G**, section through lamina depicted in **H**,  $\times 2$ ; **H**, lamina, shade form  $\times 1$ ; **I**, tepal apex  $\times 20$ ; **J**, ovary lateral view  $\times 10$ ; **K**, ovary distal view  $\times 10$ . **A - F** from Crouch 7 and **H to K** from Venter 13464.

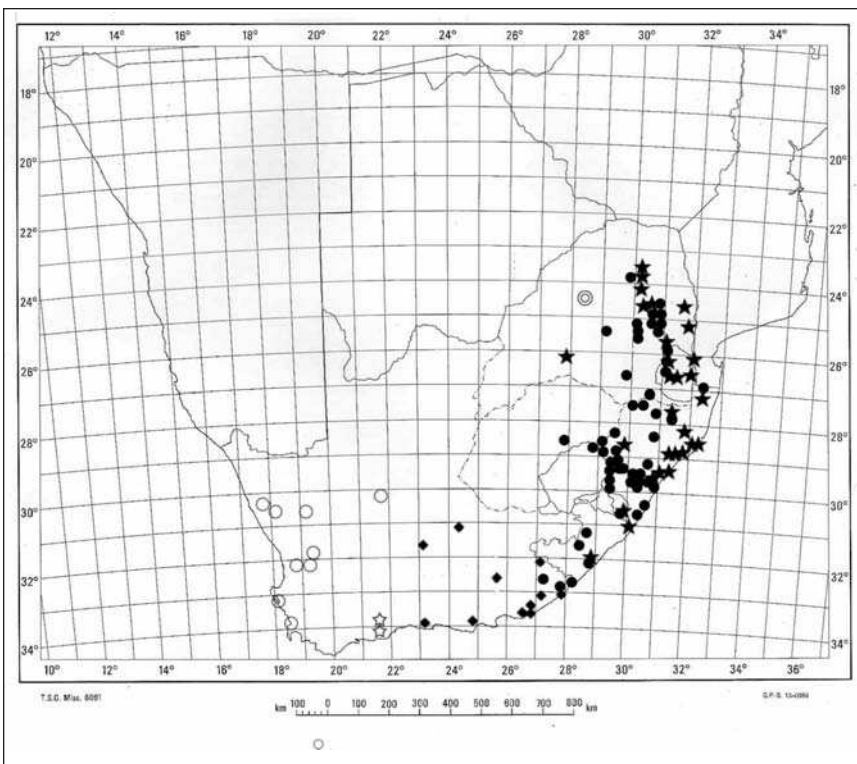


Fig. 35. Known distribution of *L. sandersonii* (solid circles), *L. socialis* (filled diamonds), *L. venteri* (open stars), *L. undulata* (open circles), *L. viscosa* (double circle) and *L. zebrina* (filled stars).

35. *Ledebouria socialis* (Baker) Jessop, Journ. S. Afr. Bot. 36(4):253 (1970).  
*Scilla socialis* Baker, Saund. Ref. Bot. 3:t.180 (1870). Type: South Africa.  
 Natal, without precise locality, Cooper 3635 (K!, holo.; PRE!,  
 photo.).  
*Scilla paucifolia* Baker, Saund. Ref. Bot. 3:t.181 (1870). Iconotype: Saund.  
 Ref. Bot. 3:t.181, "South Africa. Cape, Cooper s.n." 1870.  
*Scilla laxiflora* Baker, Gdnr's Chron. 9:668 (1891). Type: Hortus N.E.  
 Brown, Kew. (K!, holo.; BOL!, drawing).  
*Scilla violacea* Hutch., Kew Bull.:511 (1932). Type: South Africa. Cape,  
 Uitenhage Div., Hankey, Hutchinson & Long s.n. (K!, holo.; BOL!;  
 PRE!).  
*Ledebouria violacea* (Hutch.) W.L. Tjaden, British Cactus and Succ.  
 Journ. 7(1):11 (1989).



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*L. socialis* is the only species with epigeal bulbs, an erect inflorescence and small flowers with strongly reflexed lobes.

Variation: The leaf colour variation has caused confusion since 1870 in horticultural circles. Plants in cultivation originated from collections of green-leaved, mottle-leaved and silvery-leaved forms, the latter being the most popular. This resulted in Tjaden (1989) making the new combination *Ledebouria violacea* (Hutch.) W.L. Tjaden based on leaf colour only.

**Discussion:**

*L. socialis* is closely related to *L. macowanii* but differs in having epigeal bulbs.

36. *Ledebouria undulata* (Jacq.) Jessop, Journ. S. Afr. Bot. 36(4): 258 (1970).

*Drimia undulata* Jacq., Icones Plantarum Rariorum 2(15):t.376 (1794).

Iconotype: Icones Plantarum Rariorum 2(15):t.376 (1794).

*Scilla undulata* (Jacq.) Baker, Saund. Ref. Bot. 3(Append.):11 (1870).

Nom. illegit., non *S. undulata* Desf., 1798.

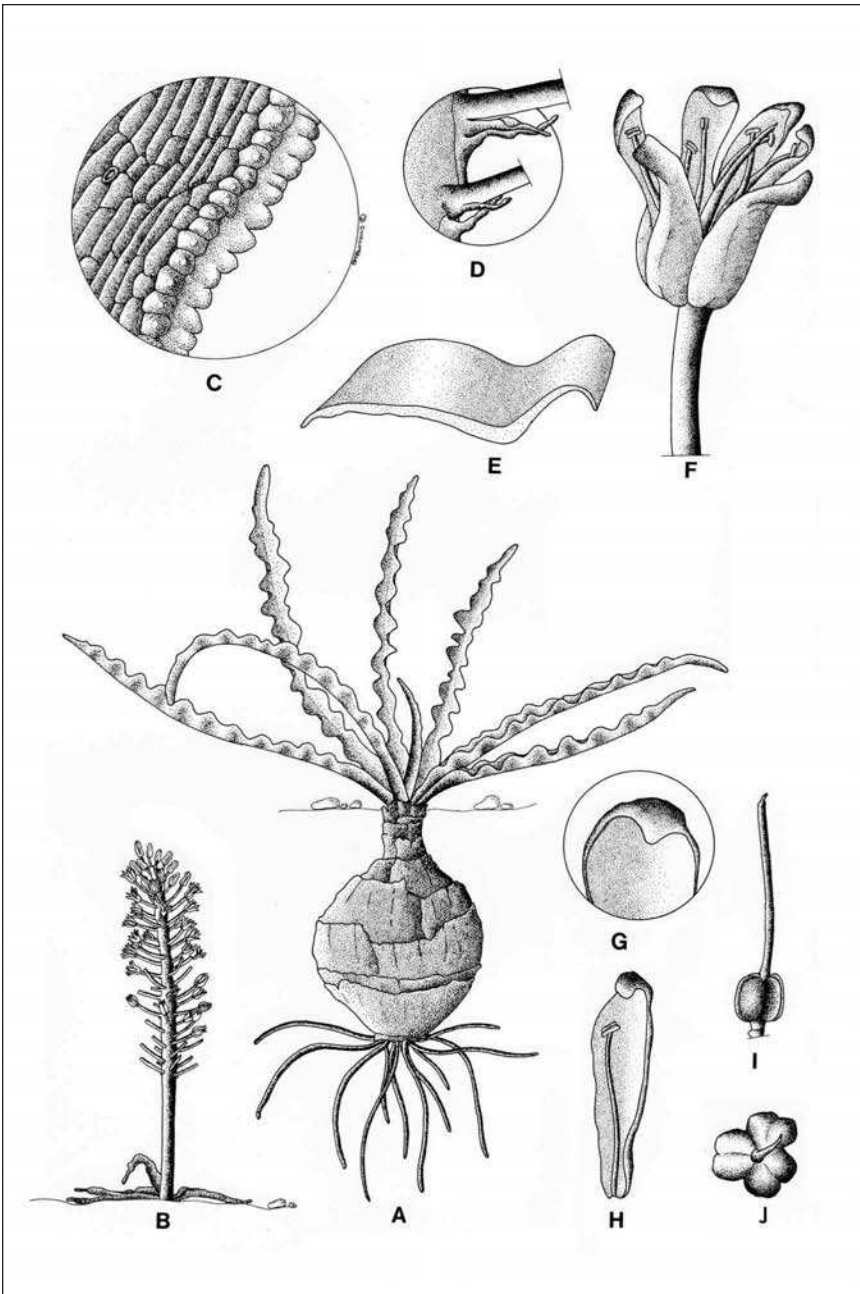
*Scilla undulatifolia* Von Poelln., Ber. dt. Ges. 41:209 (1944). Type: As for *Drimia undulata*.

**Diagnostic Features:**

*L. undulata* is the only hysteranthous species of *Ledebouria*. In leaf it is easy to identify by the fleshy texture and dull green to glaucous colour.

**Discussion:**

*L. undulata* is not related to any other *Ledebouria* species.



**Fig. 36. *Ledebouria undulata*.** **A**, habit, leafing period  $\times 1$ ; **B**, habit, flowering period  $\times 1$ ; **C**, lamina margin  $\times 300$ ; **D**, bracts with bracteoles  $\times 10$ ; **E**, section through lamina  $\times 4$ ; **F**, flower  $\times 10$ ; **G**, apex of tepal  $\times 20$ ; **H**, tepal with stamen  $\times 10$ ; **I**, ovary lateral view  $\times 10$ ; **J**, ovary distal view  $\times 10$ . **A** and **C - J** from Müller-Doblies 89129 and **B** from Hall 3200.

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37. *Ledebouria venterii* Van Jaarsv. & A.E. van Wyk, Aloe 43(4):75-77 (2006).  
Type: South Africa. Western Cape, Gouritz Poort. Van Jaarsveld 17633  
(NBG, holo.).

**Diagnostic Features:**

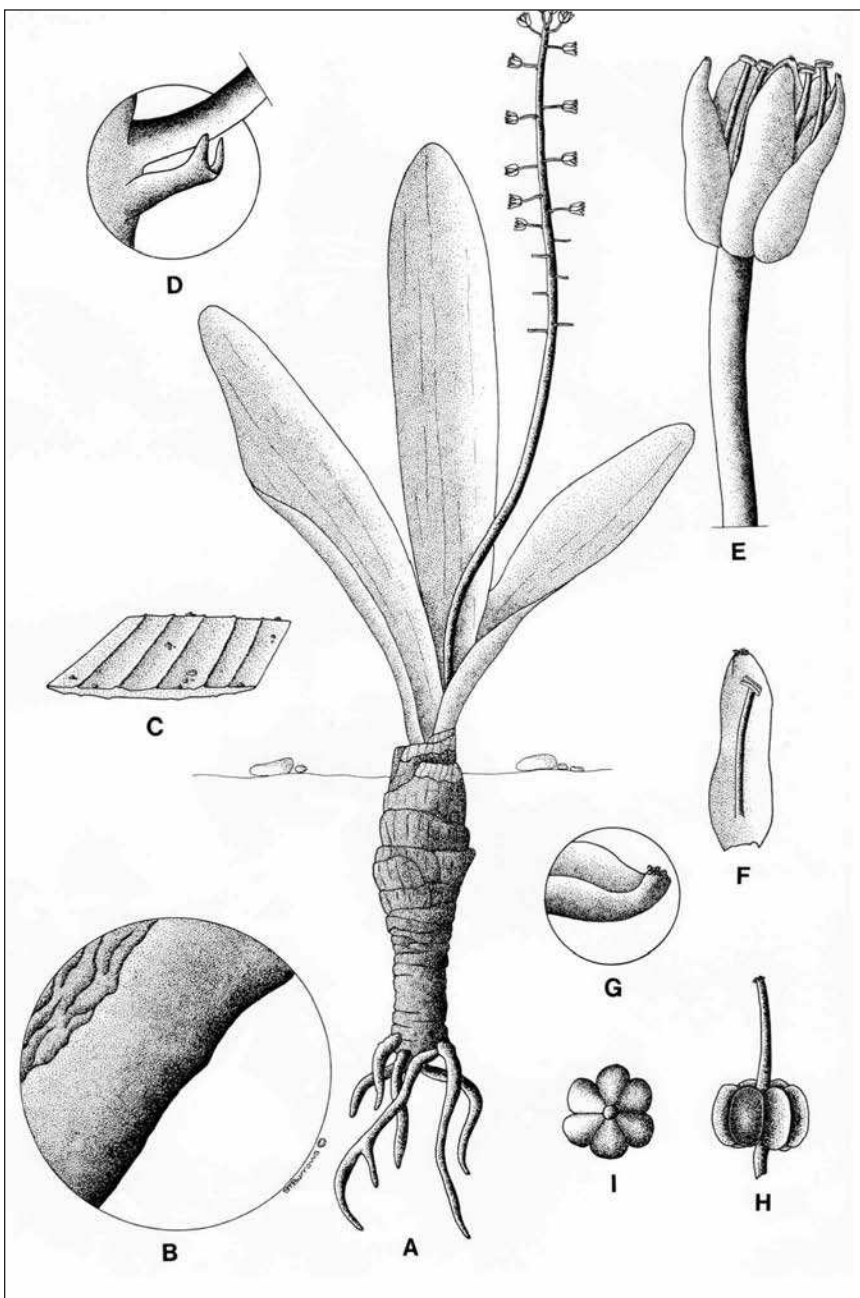
Semi-epigeal to epigeal bulbs; succulent, unspotted, linear-lanceolate leaves with a white margin and the free and fully reflexed tepals.

**Discussion:**

*Ledebouria venterii* is related to *L. concolor* but the bulbs are globose, the dry bulb scales are thin and papery with an indistinct transverse abscission layer, rachis ridged, bracts prominent and the tepals purplish green.



**Fig. 37. *Ledebouria venterii*.** Artist: Jeanette Loedloff. (Courtesy Aloe).



**Fig. 38. *Ledebouria viscosa*.** **A**, habit  $\times 1$ ; **B**, lamina margin  $\times 300$ ; **C**, section through lamina  $\times 2$ ; **D**, bract  $\times 10$ ; **E**, flower  $\times 10$ ; **F**, tepal with stamen  $\times 10$ ; **G**, tepal apex  $\times 20$ ; **H**, ovary lateral view  $\times 10$ ; **I**, ovary distal view  $\times 10$ . All from Venter 13455.

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38. *Ledebouria viscosa* Jessop, Journ. S. Afr. Bot. 36(4):264 (1970). Type: South Africa. Transvaal, Thabazimbi, Kransberg, Meeuse 10493 (PRE!, holo.).

**Diagnostic Features:**

The cylindrical bulb with long basal stem, erect leaves covered with a resinous layer and the solitary lax inflorescence, bifurcate membranous bracts without bracteoles, almost tubular perianth and prominent apex shoulders of the ovary.

**Discussion:**

*L. viscosa* cannot be confused with other *Ledebouria* species in South Africa. The erect viscid leaves and solitary erect inflorescence are diagnostic.

39. *Ledebouria zebrina* (Baker) S. Venter, comb. nov., Type: South Africa. "Cape of Good Hope, Cooper s.n.," Iconotype: Saund. Ref. Bot. 3:t.185 (1870).

*Scilla zebrina* Baker, Saund. Ref. Bot. 3:t.185 (1870).

*Scilla microscypha* Baker, Gdnr's Chron. 16:102 (1881). Type: South Africa. Cape, eastern Provinces, Bowker s.n. (K!, holo.; PRE!, photo.).

*Scilla megaphylla* Baker, Flora Cap. 6:490 (1896). Type: South Africa. Transvaal, near Barberton, Galpin 1184 (GRA!, lecto.; NH!; PRE!, photo.; SAM!) (lecto. selected here - Art. 9.3, Greuter et al. 1988).

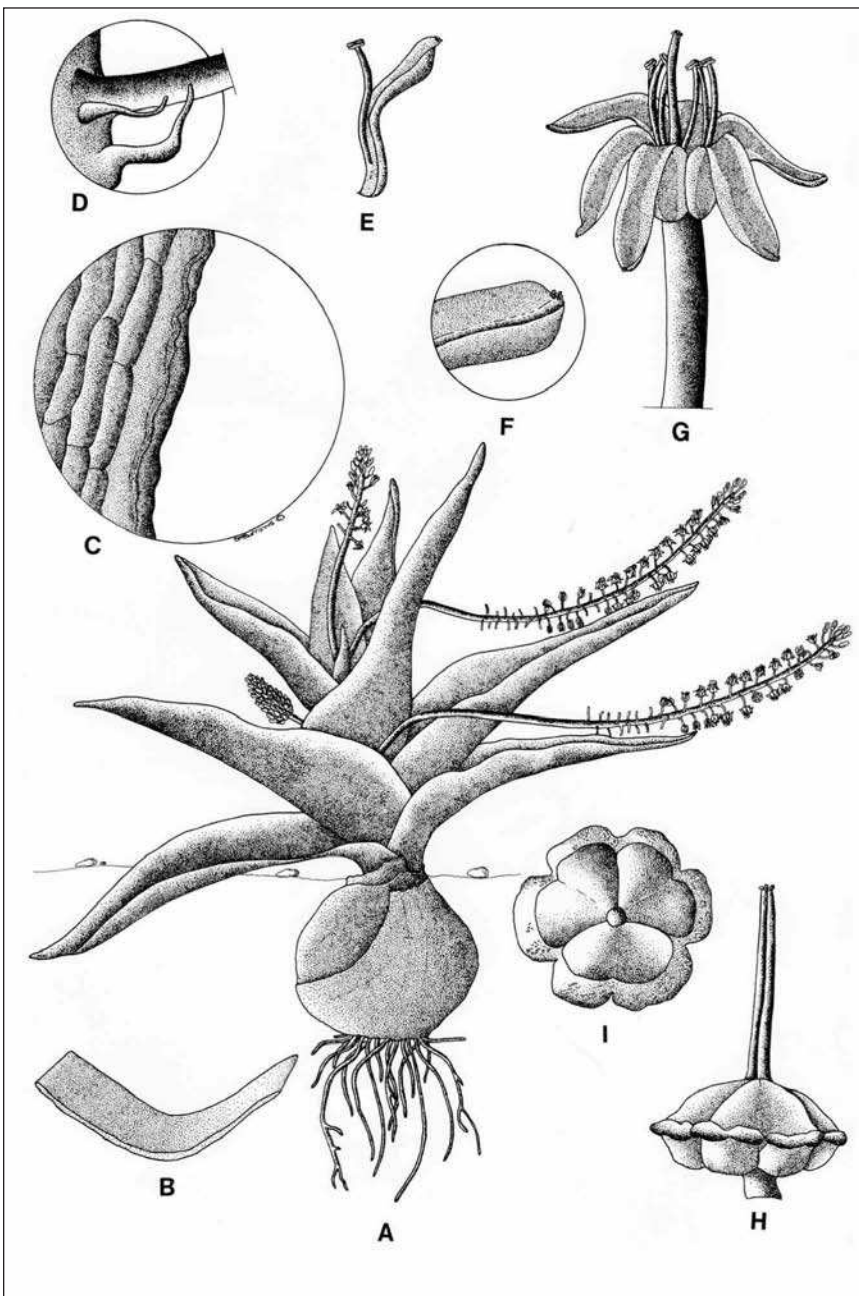
*Scilla grandifolia* Schönl., Rec. Albany Mus. 3:61 (1914). Type: South Africa. Transvaal, Tzaneen, Duiwelskloof, F.A. Rogers s.n. (GRA!, holo.; PRE!, photo.).

**Diagnostic Features:**

Leaves large (300-500 × 90-120 mm), leaf base flat to shallowly canaliculate; inflorescences many (4-10), scape base winged to angled, bracteoles below membranous bracts, tepals light green with darker green keels and apex tapering into the white to light green style.

**Discussion:**

Discussion: Resembles large plants of *L. floribunda* but the leaves are far larger, more than double the number of inflorescences and the flowers are green.



**Fig. 39. *Ledebouria zebrina*.** **A**, habit  $\times 0.25$ ; **B**, section through lamina  $\times 0.5$ ; **C**, lamina margin  $\times 300$ ; **D**, bract with bracteole  $\times 5$ ; **E**, tepal with stamen  $\times 5$ ; **F**, apex of tepal  $\times 10$ ; **G**, flower  $\times 5$ ; **H**, ovary lateral view  $\times 10$ ; **I**, ovary distal view  $\times 10$ . All from Venter 13395.



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