

FSA contributions 6: Orchidaceae: *Holothrix*

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1408000 HOLOTHRIX

Holothrix Rich. ex Lindl., The genera and species of orchidaceous plants: 283 (1835), nom. cons.; Benth. & Hook.f. 3: 623 (1883); Schltr.: 443 (1898); Schltr.: 12 (1899a); Schltr.: 202 (1899b); Rolfe: 96 (1913); Schelpe: 66 (1966); Schelpe: 5 (1977); R.A.Dyer: 989 (1976); Immelman: 455 (1981); J.L.Stewart et al.: 58 (1982). Type: *H. parvifolia* Lindl. (1835) nom. illegit., type cons. (= *H. brevipedata* Immelman & Schelpe).

Scopularia Lindl.: t. 1701 (1834)

Monotris Lindl.: t. 1701 (1834)

Tryphia Lindl.: t. 1701 (1834)

Saccidium Lindl.: 302 (1835)

Bucculina Lindl.: 209 (1836)

Deroemera Rchb.f.: 29 (1852); Rendle: 277 (1895) as *Deroemeria*.

Terrestrial or lithophytic tuberous herbs. *Leaves* two, one sometimes much reduced (or absent?), ovate or orbicular, flat on ground, sometimes withered before flowering. *Scape* arising between two leaves, erect, unbranched, usually pubescent, with or without bracts. *Inflorescence* a spike, usually secund or subsecund. *Flowers* resupinate (except in *H. majubensis*), from 1.5 up to 25 mm long. *Sepals* subequal, sometimes connate, green, smaller than petals. *Petals* free or partly adnate to lip, green, cream, white or marked with red or purple, entire or with apex fimbriate, if entire then apices either thickened and fleshy or whole petal membranous; *lip* fleshy or membranous,

entire or divided into three to many lobes, sometimes fimbriate, coloured as for petals, produced into a spur. *Column* usually small, simple and erect, fused basally to lip, in one species forming an open arch; anther sacs above stigma; rostellum much reduced. *Pollinia* two, in anther sacs, granular, each with a short caudicle and separate viscidium; viscidia naked, often resting on small flaps of tissue on either side of column.

Species about 55, distributed from Arabia through eastern and West tropical Africa, and the Cameroons, to South Africa; also in Madagascar, the Comoro Islands and Socotra. There are 23 species in southern Africa, with the greatest concentration in the Western Cape (see Guide for authors to *Bothalia*, p. 208: figure 1).

All measurements of lip and petal breadth are taken across the base of the lobes where these occur, except where otherwise stated. In undivided petals and lip the breadth is taken at the broadest point. Length is the total length of lip or petal. Scape length is also the total length of the scape, including the flowering portion.

In some of the species, details of flower colour, inflorescence and papillae are given. This has been possible where living or pickled specimens were seen. It is of interest to note that in all these the anther sacs are usually a darker and contrasting colour to the rest of the column, and to the flower as a whole.

Holothrix is derived from the Greek words for 'completely hairy', and refers to the squamous or hispid vegetative parts of the type species.

Key to southern African species of *Holothrix*

- 1a Scape with bracts:
 2a Petals entire 19. *H. culveri*
 2b Petals divided:
 3a Flowers dimorphic 20. *H. burchellii*
 3b Flowers not dimorphic:
 4a Lip lobes filamentous; Gauteng and Northern Province 21. *H. randii*
 4b Lip lobes thickened; Northern, Western and Eastern Cape:
 5a Spur $\frac{1}{2}$ to nearly equal length of lip; scape with a covering of short, fine, somewhat velvety hairs 22. *H. schlechteriana*
 5b Spur $\frac{1}{3}$ - $\frac{1}{4}$ length of lip; scape usually glabrous but sometimes with a few short hairs at base 23. *H. grandiflora*
- 1b Scape without bracts:
 6a Petals divided at apex into 3 or 5 lobes:
 7a Spur $1\frac{1}{4}$ -2 times length of lip; petals 5-lobed; Namaqualand (Northern Cape) 12. *H. filicornis*
 7b Spur $\frac{1}{4}$ -equal length of lip; petals 3-lobed; Eastern Cape, KwaZulu-Natal, Lesotho, Mpumalanga 13. *H. scopularia*
 6b Petals entire:
 8a Petals green or cream, carose at apices:
 9a Flowers not resupinate 7. *H. majubensis*
 9b Flowers resupinate:
 10a Petals linear; lip lobes short and triangular with obtuse apices 1. *H. pilosa*
 10b Petals broader at centre than at apex; lip lobes various:
 11a Lip entire or three-lobed:
 12a Spur longer than lip 2. *H. longicornu*
 12b Spur shorter than lip:

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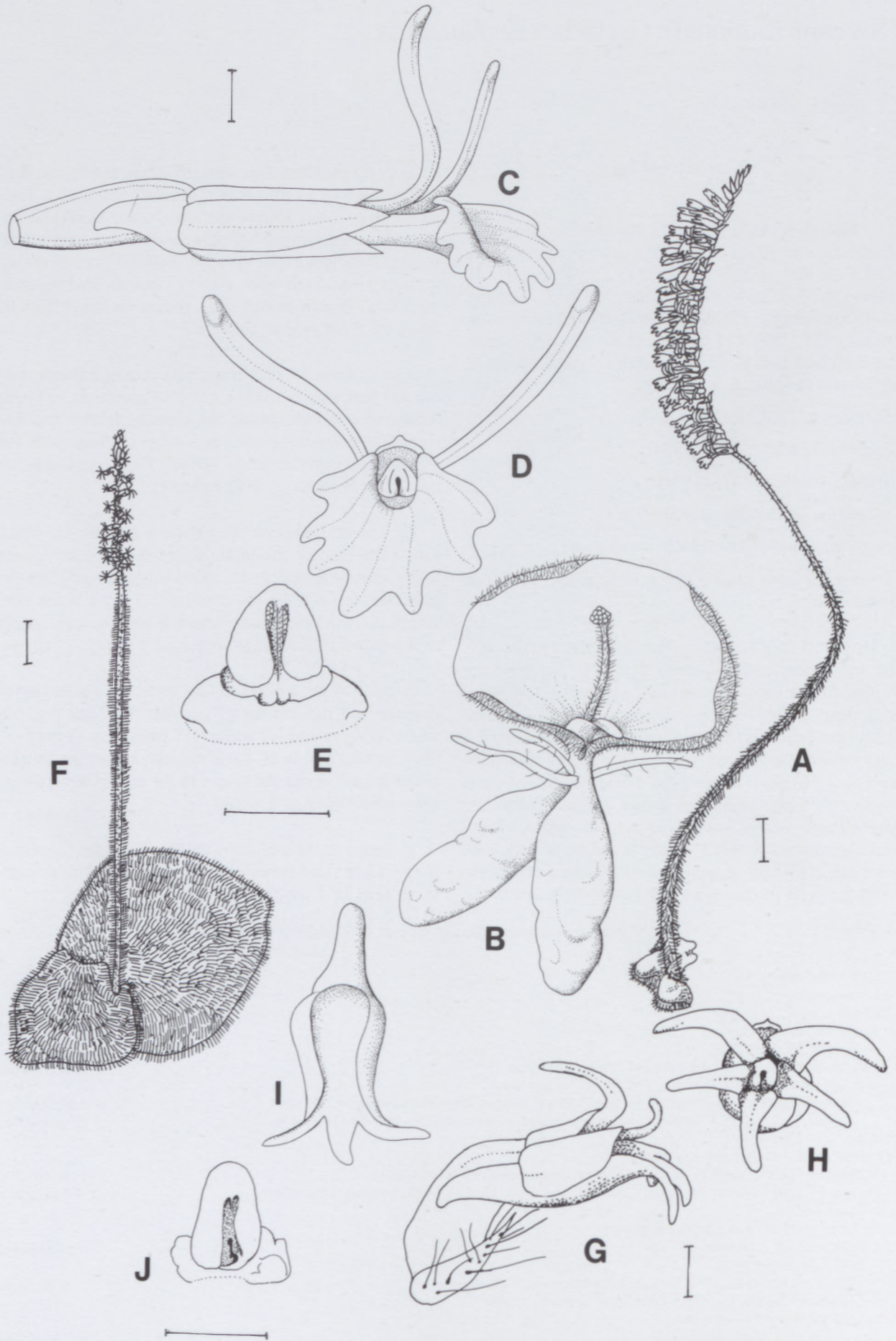


FIGURE 1.—A–E, *Holothrix pilosa*, Schelpe s.n.: A, habit; B, plant with leaf before shrivelling and tubers; C, flower, side view; D, flower, front view; E, column. F–J, *H. villosa* var. *villosa*, Esterhuysen s.n.: F, habit; G, flower, side view; H, flower, front view; I, lip from above; J, column. A, E–H, J, drawn by K. Immelman; B–D, I, drawn by G. Condy. Scale bars: A, B, F, 10 mm; C–E, G–J, 1 mm.

- 13a Lip entire 3. *H. exilis*
 13b Lip 3-lobed:
 14a Breadth of central lip lobe at least half its length 4. *H. brevipetala*
 14b Breadth of central lip lobe less than half its length, linear:
 15a Lip lobes subequal in length:
 16a Hairs on leaves usually broad and flattened (squamules), these rarely restricted to margins, hairs on scape reflexed and hispid 5. *H. cernua*
 16b Leaves villous, hairs on scape at right angles to scape:
 17a Scape slender; inflorescence lax; lip lobes narrowly linear 6a. *H. villosa* var. *villosa*
 17b Scape short and stout; inflorescence dense; lip lobes broadly linear 6b. *H. villosa* var. *condensata*
 15b Side lobes of lip half or less than half of length of central lobe:
 18a Leaf usually withered at anthesis, with hispid hairs; Drakensberg 8. *H. thodei*
 18b Leaf not usually withered at anthesis, with fine soft hairs, Western and Eastern Cape, mainly lowland 3. *H. exilis*
- 11b Lip lobes 5-7:
 19a Gauteng, Free State, Lesotho, KwaZulu-Natal, if Eastern Cape then montane and hairs villous:
 20a Petals more than 5 mm long; flowering December to April 10. *H. incurva*
 20b Petals less than 5 mm long; flowering September and October 11. *H. micrantha*
 19b Western Cape, if Eastern Cape then not montane and hairs squamous or hispid:
 21a Spur longer than lip 2. *H. longicornu*
 21b Spur shorter than lip:
 22a Base of petals adnate to lip; leaves glabrous 9. *H. secunda*
 22b Petals free from lip; leaves with hairs or squamules:
 23a Length of lip lobes usually less than twice the breadth 4. *H. brevipetala*
 23b Lip lobes linear, more than twice as long as broad 5. *H. cernua*
- 8b Petals white, membranous at apices:
 24a Lip lobes 5:
 25a Spur circinnate; leaves uniform in colour; bases of petals adnate to lip 14. *H. parviflora*
 25b Spur straight; leaves veined with white; petals free from lip 15. *H. orthoceras*
 24b Lip lobes 7 or more, or indefinite with lip serrate along margin:
 26a Lip lobes 7:
 27a Lip lobes acute, broadly triangular except for a longer and narrower lobe on either side; petals tapering to an acuminate apex; leaves veined with white; east of Port Elizabeth 15. *H. orthoceras*
 27b Lip lobes truncate or obtuse, lobes on either side of central lobe shorter than central lobe; petal apices rounded; leaves uniformly green; mostly west of Port Elizabeth:
 28a Inflorescence condensed at apex of spike; spur short and straight 16. *H. mundii*
 28b Inflorescence lax; spur curved abruptly forward under lip 17. *H. aspera*
 26b Lip lobes more than 7, or lip serrated:
 29a Outermost lip lobe on either side longer than central lobes; leaves veined with white; Northern Province to Eastern Cape 15. *H. orthoceras*
 29b Lobes of lip subequal, very short, giving lip a serrated appearance; leaves not veined with white; Eastern Cape 18. *H. macowaniana*

1. *Holothrix pilosa* (Burch. ex Lindl.) Rchb.f. in *Otia botanica hamburgensia*: 119 (1881); J.L. Stewart et al.: 60 (1982). Type: Swellendam Div., on a dry hill east of Breede River, *Burchell 7483* (K!).

Saccidium pilosum Lindl.: 302 (1835).

Leaves large, succulent, upper surface glabrous, rarely with hairs, undersurface densely pilose with long, fine hairs, usually withered at anthesis; upper leaf reduced in size. Scape without bracts, 160–550 mm long, densely pilose with long, fine hairs, hairs recurved at base of scape, at right angles to scape at its apex. Inflorescence secund. Sepals 2.5–5.0 × 1.0–2.5 mm, glabrous, edges noticeably paler than bright green centre. Petals entire, carinose at apices, narrowly linear, 5.5–10.0 × 0.5–1.0 mm, creamy white with a green centre; lip divided into (3–)5–8 short, broad, obtuse, carinose lobes, long and narrow, 5.5–9.0 × 4.5–9.0, cream with green veins. Spur broadly conical, straight or slightly curved, 1.5–5.5 mm long. Anther sacs yellow. Figure 1A–E.

H. pilosa occurs in the southern Cape region (Figure 2) from Bredasdorp (Western Cape) to Port Elizabeth (Eastern Cape), and grows in semi-arid, stony localities. Flowering time: November to March.

The long, linear petals and long narrow lip, which together form a narrow cylindrical tube, are characteristic of this species. The inflorescence is strictly secund.

Vouchers: *Linder 1704* (BOL); *Long 938* (PRE); *Muir 1225* (BOL); *Thode A26392* (PRE).

2. *Holothrix longicornu* G.J. Lewis in *Journal of South African Botany* 4: 53 (1938); J.L. Stewart et al.: 60 (1982). Type: Port Elizabeth, *Cutting 69* (BOL, holo!). Figures 2; 8N.

Leaves with dense, short, fine, retrorse hairs. Scape without bracts, 65–154 mm long, with dense, short, re-

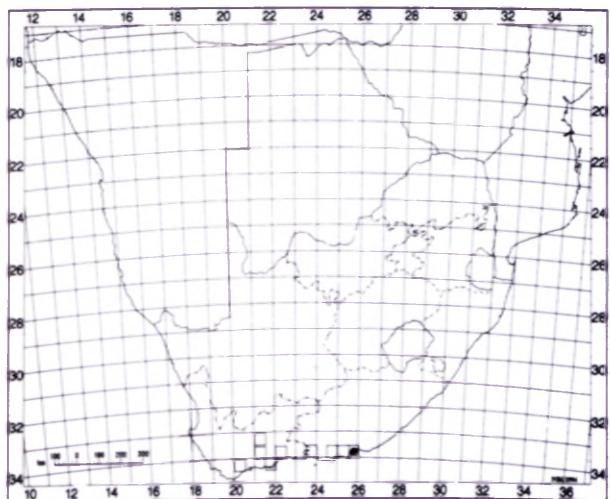


FIGURE 2.—Distribution of *Holothrix pilosa*, □; *H. longicornu*, ●.

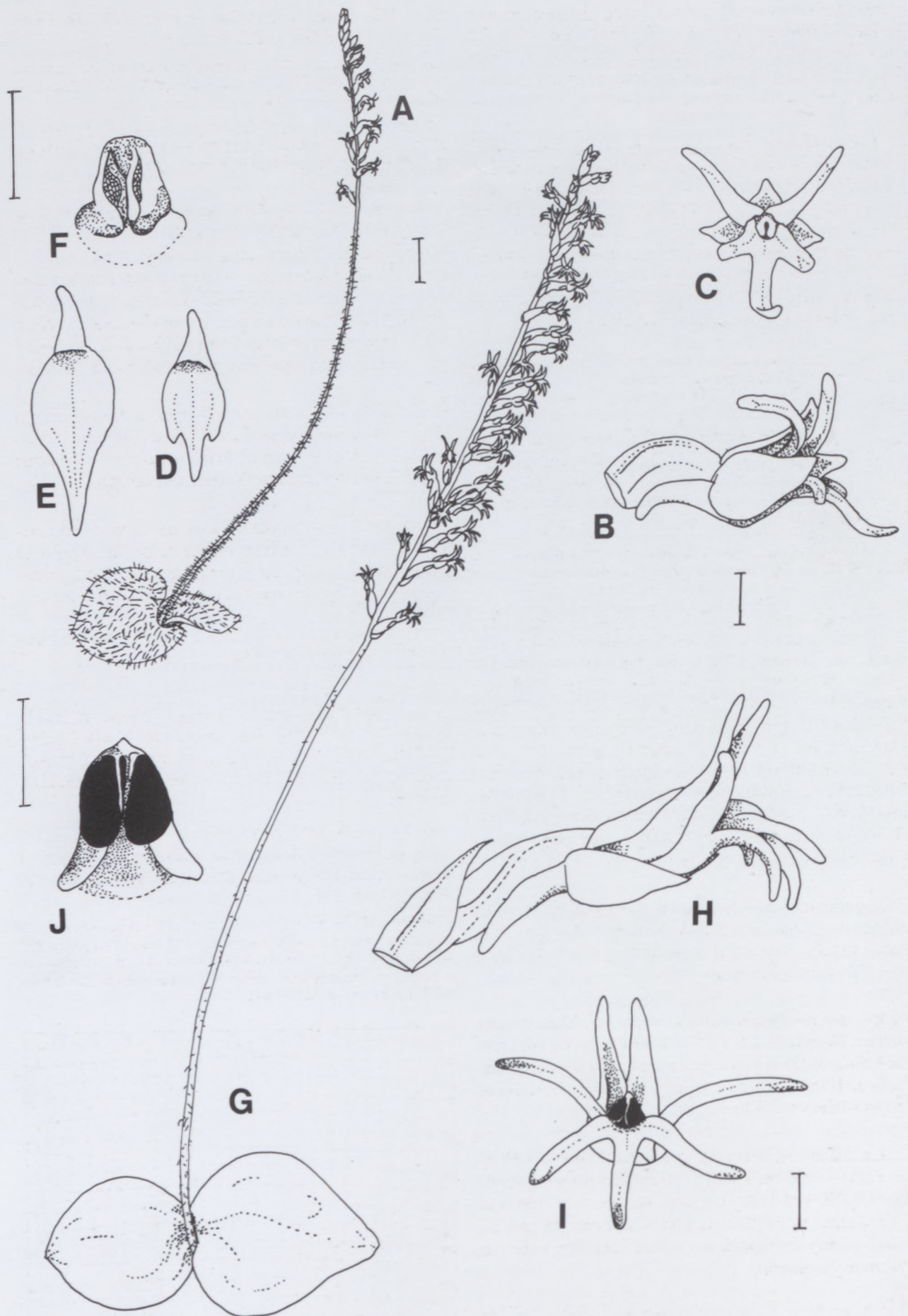


FIGURE 3.—A–F, *Holothrix exilis*: A, habit; B, flower, side view; C, flower, front view; D, lip with short side lobes, Esterhuysen 21205; E, lip without side lobes, Esterhuysen 18356; F, column. G–J, *H. secunda*, Schelpe 7900: G, habit; H, flower, side view; I, flower, front view; J, column. Drawn by K. Immelman. Scale bars: A, G, 10 mm; B–F, H–J, 1 mm.

curved hairs. *Sepals* 1.5–2.5 × 1.0 mm, glabrous, connate at base. *Petals* entire, carnose at apices, 2.5–3.5 × 0.5 mm; *lip* carnose, divided into 3–5 short, broadly linear lobes, 2.5–3.0 × 1.0–1.5 mm. *Spur* narrowly conical, straight, longer than lip, 3–4 mm long.

Holothrix longicornu is probably closely related to *H. cernua* (No. 5) and *H. brevipedata* (No. 4), all three species having recurved, hispid hairs on the scape. However, the short lip lobes (Figure 8N) distinguish it from the former, and the long, straight spur distinguishes it from both. Only the type has been seen but, as there are a number of plants in the type gathering, and they consistently show these characters, it can be regarded as a species separate from both the above-mentioned species.

Voucher: the only specimen of this species is the type, which was collected in October. The habitat is not known.

3. *Holothrix exilis* Lindl., The genera and species of orchidaceous plants: 283 (1835); Immelman: 456 (1981); J.L.Stewart et al.: 59, t. 1.1 (1982). Type: in a walk to the white clay pit, bearing true N-E from our station at Zoetmelksrivier, *Burchell 6738-1* (K!).

H. exilis var. *brachylabris* (Sond.) Bolus: t. 14A (1896). *H. brachylabris* Sond.: 78 (1847). Type: Uitenhage, *Zeyher s.n.* (K!).

Leaves densely to very sparsely pilose with long, fine hairs, small, sometimes withered at anthesis. *Scape* without bracts, slender, 40–290 mm long, densely to very sparsely pilose with long, fine hairs at right angles to scape. *Inflorescence* usually lax with small flowers. *Sepals* 0.8–2.5 × 0.5–1.0 mm, usually glabrous or with a few long hairs. *Petals* entire, with carnose apices, 1.5–4.0 × 0.3–1.0 mm, creamy green; *lip* carnose, entire or three-lobed with outer lobes from very short to half as long as central lobe, 1.8–3.5 × 0.5–1.5 mm, creamy green. *Spur* slightly curved, 0.8–1.8 mm. *Anther sacs* pale yellow-green. Figure 3A–F.

H. exilis occurs in the coastal regions of the Western and Eastern Cape from the Saldanha area, the Cape Peninsula and Riversdale to Kei Mouth (Figure 4). Flowering time: October to March.

H. exilis can be distinguished from *H. villosa* (No. 6) by the side lobes of the lips which are up to 0.4 times the length of the central lobe, or absent, while *H. villosa* has side lobes (always present) from 0.6 to 1.0 times the length of the central lobe.

The variety *H. exilis* var. *brachylabris* was described by Bolus on the basis of an unlobed rather than a three-lobed lip. However, the length of the side lobes varies in a continuous rather than disjunct manner in the species, from scarcely discernable to well defined. The variety is therefore not upheld.

Vouchers: *Flanagan 1298* (PRE); *Glass 6237* (BOL); *Hall 1162* (BOL); *Jeppe s.n.* (PRE).

4. *Holothrix brevipedata* Immelman & Schelpe in Immelman in *Bothalia* 13: 455 (1981); J.L.Stewart et al.:

60 (1982). Type: Humansdorp, koppie above Oudebos, *Jeppe in PRE 33391* (PRE, holo.!; K, iso!).

H. parvifolia Lindl.: 283 (1835), partly as to part of description (see also *H. cernua*, No. 5), non *H. parvifolia* Lindl. (1836) which is *H. villosa* (No. 6).

Holothrix hispidula sensu Schltr.: 443 (1898); Bolus: t. 17 (1913); Bolus: t. 13 (1918) all excl. syn. L.f. (1782) and Thunb. (1794, 1823), non (L.f.) T.Durand & Schinz which is *H. cernua* (No. 5).

Leaves densely covered with small squamules or stout hairs, sometimes withered at anthesis. *Scape* without bracts, stout, 60–310 mm long, with stout, hispid, reflexed hairs. *Sepals* 1.0–2.5 mm, densely pilose. *Petals* entire, carnose at apices, 2.5–3.5 × 0.5–1.5 mm, yellow-green; *lip* and petals sometimes warty, lip carnose, oval in outline with 3–5 short, broad lobes (Figure 8Q), 2.5–3.5 × 2.0–3.5 mm, yellow-green. *Spur* slightly curved, 1.0–2.0 mm.

H. brevipedata occurs in the Western and Eastern Cape (Figure 4). It grows in sand and shallow soil in rock crevices. Flowering time: can be found in flower from August to April, usually between October and January.

The squamules or stout hairs on the leaves of this species, and the reflexed hairs on the scape, are similar to those of *H. cernua*. However, the lip lobes are much shorter and relatively broader than the linear lobes of *H. cernua*.

Vouchers: *Bruyns 141/75* (PRE); *Glass s.n.* (34859 in PRE); *Schlechter 464* (BOL); *Wolley Dod 2339* (BOL).

5. *Holothrix cernua* (Burm.f.) Schelpe in *Orchid Review* 74: 394 (1966); Immelman: 456 (1981); J.L.Stewart et al.: 60, t. 1.13 on p. 63 [not t. 1.13 on p. 62 which is *H. secunda* (No. 9)]. Type: Cap. bon. spei, *Burmam f. s.n.* (G!).

Orchis cernua Burm.f.: 30 ('26') (1768).

Orchis hispidula L.f.: 401 (1782). *Holothrix hispidula* (L.f.) T.Durand & Schinz: 5: 70 (1895) Type: Cape of Good Hope, *Sparman 34* (LINN, microfiche in PRE!).

Orchis hispida Thunb.: 4 (1794); Thunb.: 6 (1823). *H. parvifolia* Lindl.: 283 (1835) partly excl. part of description which fits *H. brevipedata* (No. 4). Lectotype: C.B.S., in arenosis depressis extra Cap. in summitate Tafelberg (sic!) et rupibus lateris occidentalis ejusdem montis, *Thunberg α* (UPS, microfiche No. 21201 at PRE!).

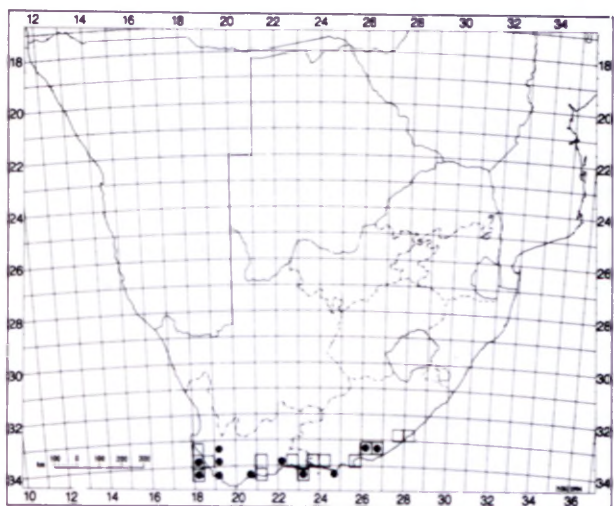


FIGURE 4.—Distribution of *Holothrix exilis*, □; and *H. brevipedata*, ●.

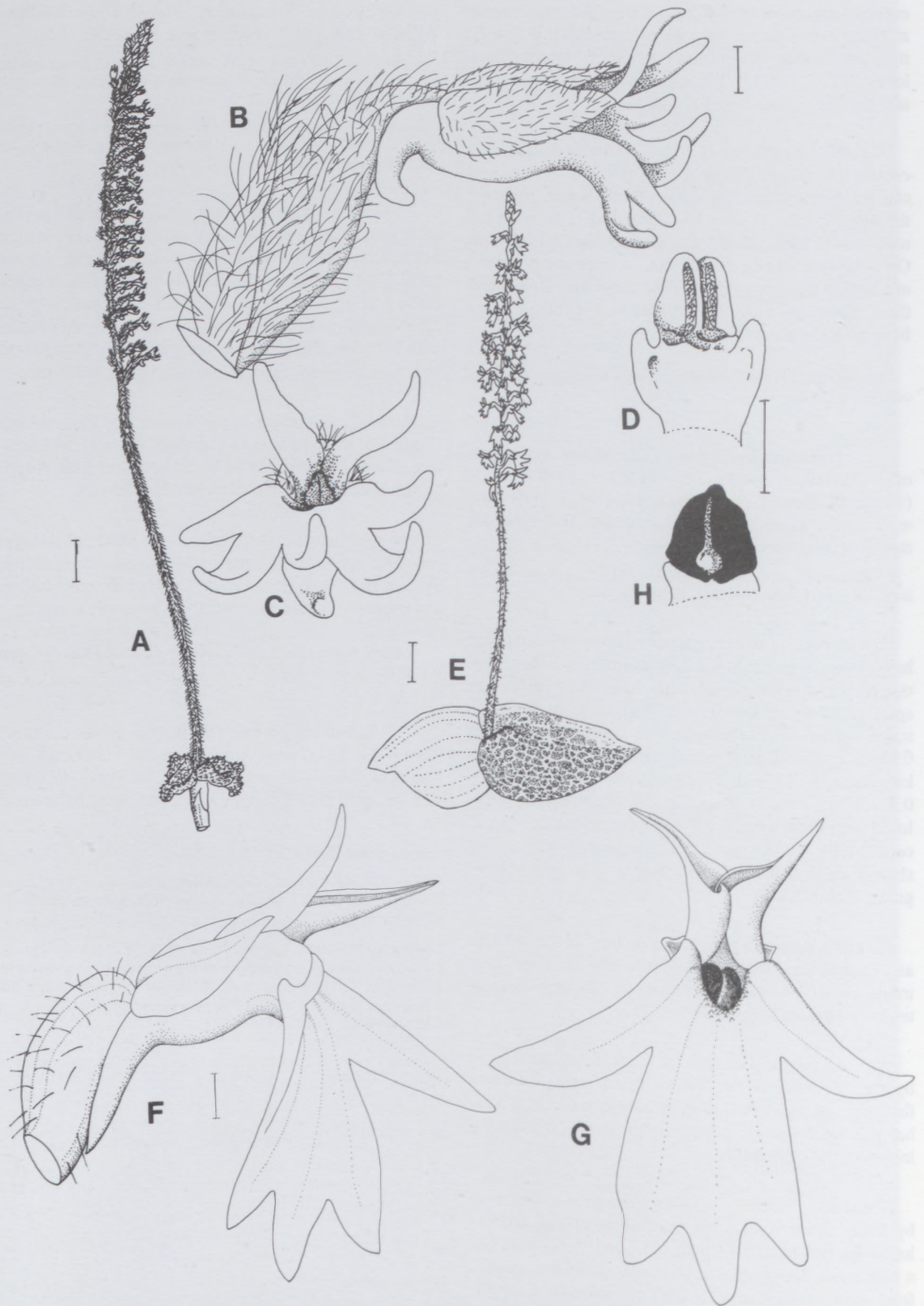


FIGURE 5.—A–D, *Holothrix cernua*, Linder 1792: A, habit; B, flower, side view; C, flower, front view; D, column. E–H, *H. orthoceras*, Royal Natal National Park s.n.: E, habit; F, flower, side view; G, flower, front view; H, column. A–E, H, drawn by K. Immelman; F, G, drawn by G. Condry. Scale bars: A, E, 10 mm; B–D, F–H, 1 mm.

Monotris secunda Lindl.: 303 (1835) non *Orchis secunda* Thunb. *H. monotris* (Lindl.) Rchb.f.: 119 (1881). Type: between Mossel Bay and Gouritz River, *Burchell 6369* (K!).

H. gracilis Lindl.: 207 (1836); Bolus: 116 (1888). Type: Table Mountain, *Drège 1253a* (P!).

H. harveyana Lindl.: 206 (1836); Hook.f.: 103 A (1837). Type: Cape Peninsula, low sandy moist plains, called 'The Flats' which extend almost from Table Bay to False Bay (Cape Flats), *Harvey s.n.* (TCD!).

H. squamulosa Lindl.: 206 (1836); Bolus: t. 18 (1913), t. 11 (1918). *H. squamulosa* var. *typica* Schltr.: 442 (1898). Type: Cape Province, mountains near De Liefde, Koratra, *Drège 1235c* (K!).

H. squamulosa var. *hirsuta* Bolus: 236 (1888). Type: Cape Peninsula, moist sandy places on Cape Flats, especially after burning; sometimes on old thatched roofs near Rondebosch, *Bolus 7022b* (BOL!; K!).

H. squamulosa var. *scabra* Bolus: 114, t. 23a (1888). Type: Cape Peninsula, moist sandy places on Cape Flats, especially after burning; sometimes on old thatched roofs near Rondebosch, *Bolus 7022a* (BOL!).

H. squamulosa var. *glabrata* Bolus: t. 18 (1913). Type: Cape Peninsula, moist sandy places on Cape Flats, especially after burning; sometimes on old thatched roofs near Rondebosch, *Bolus 7022c* (BOL!; K!).

Leaves with a dense covering of squamules or small, stiff hairs, rarely glabrous with hairs on the margins only, sometimes withered before anthesis. *Scape* without bracts, slender or stout, 90–240 mm long, with long, hispid, deflexed hairs. *Sepals* 1.5–3.0 × 0.5–1.5 mm, densely hirsute. *Petals* entire, carnose at apices, 3.5–7.0 × 0.5–1.5 mm, cream to lime-green; *lip* carnose with 3–5 or (6 or 7) lobes (Figure 8D), central lobe the longest, lobes comprising $\frac{1}{3}$ to $\frac{1}{2}$ the length of whole lip, colour as for petals. *Spur* curved, 1.5–4.0 mm long. *Anther sacs* chestnut-brown (Figure 5A–D).

H. cernua is found mainly in the Western Cape, from the Gifberg to the George area, but extends also along the southern Cape lowland as far east as Grahamstown in the Eastern Cape (Figure 6). It grows in sandy or stony places, often flowering after fire. Flowering time: July to January.

Vouchers: *Bolus 11383* (BOL); *Galpin 4587* (PRE); *Hall 1107* (BOL); *Oliver 4587* (PRE).

6. *Holothrix villosa* Lindl. in Hooker's Companion to the Botanical Magazine 2: 207 (1836).

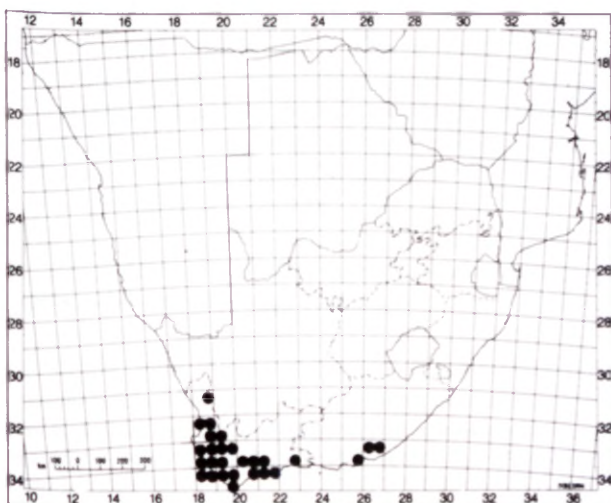


FIGURE 6.—Distribution of *Holothrix cernua*.

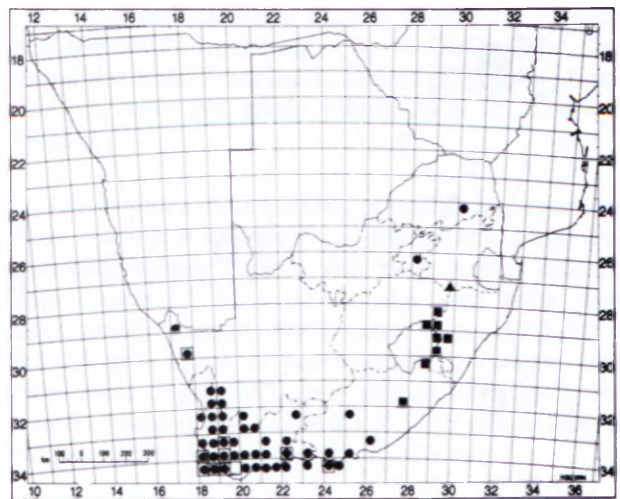


FIGURE 7.—Distribution of *Holothrix villosa* var. *villosa*, ●; *H. villosa* var. *condensata*, □; *H. majubensis*, ▲; and *H. thodei*, ■.

The species is divided into two varieties: var. *condensata* is generally shorter and stouter, with a denser inflorescence and broader lip lobes than var. *villosa*.

6a. var. *villosa*

Bolus: t. 14b (1896), Bolus: t. 14B (1918); Immelman: 456 (1981); J.L. Stewart et al.: 61, t. 1.9a (1982). Type: Groot Drakenstein and at the foot of Paarl Mountain, under 1000 ft, *Drège 1235a* (K!).

Orchis hispida Thunb.: 4 (1794); Thunb.: 6 (1823) p.p. quoad spec. *Thunberg* β (UPS, microfiche no. 21202 at PRE!).

H. parvifolia Lindl.: 207 (1836) non *H. parvifolia* Lindl. (1835) see *H. brevipedata* (No. 4) and *H. cernua* (No. 5); Hook.f.: 103B (1837). Type: about Cape Town and Wynberg, in the driest and most barren hills and wastes in a stony and gravelly soil, *Harvey s.n.* (TCD?).

Leaves with few to many long, straight hairs. *Scape* without bracts, 30–365 mm long, densely to sparsely pilose with long, straight hairs at right angles to scape. *Sepals* 1.0–2.5 × 0.5–1.5 mm, glabrous or with short, straight hairs. *Petals* entire, carnose at apices, 1.5–4.5 × 0.5–1.5 mm, cream to yellow-green; *lip* carnose, divided into three subequal lobes, 1.4–4.0 × 0.5–3.0 mm. *Spur* broadly conical, curved, 2.0–5.5 mm long. *Column* green. *Anther sacs* yellow-green. Figure 1F–J.

H. villosa is probably the commonest species of *Holothrix* in southern Africa, as well as the most widespread. The typical variety occurs in western Northern Cape and throughout the Western Cape, and in the western part of Eastern Cape (Figure 7). It has recently been found (disjunctly) as far north as Gauteng (Johannesburg) and the Northern Province. It grows in rock crevices and in fynbos on hillsides. Flowering time: August to December.

The 3-lobed lip and patent hairs on the scape will distinguish *H. villosa* from the occasional specimens of *H. cernua* (No. 5) which do not have squamules on the leaves.

Vouchers: *Bolus 11638* (BOL); *Esterhuysen 22291* (BOL); *Galpin 4588* (PRE); *Leistner 435* (PRE); *Oliver 5058* (PRE); *Venter 10276* (PRE).

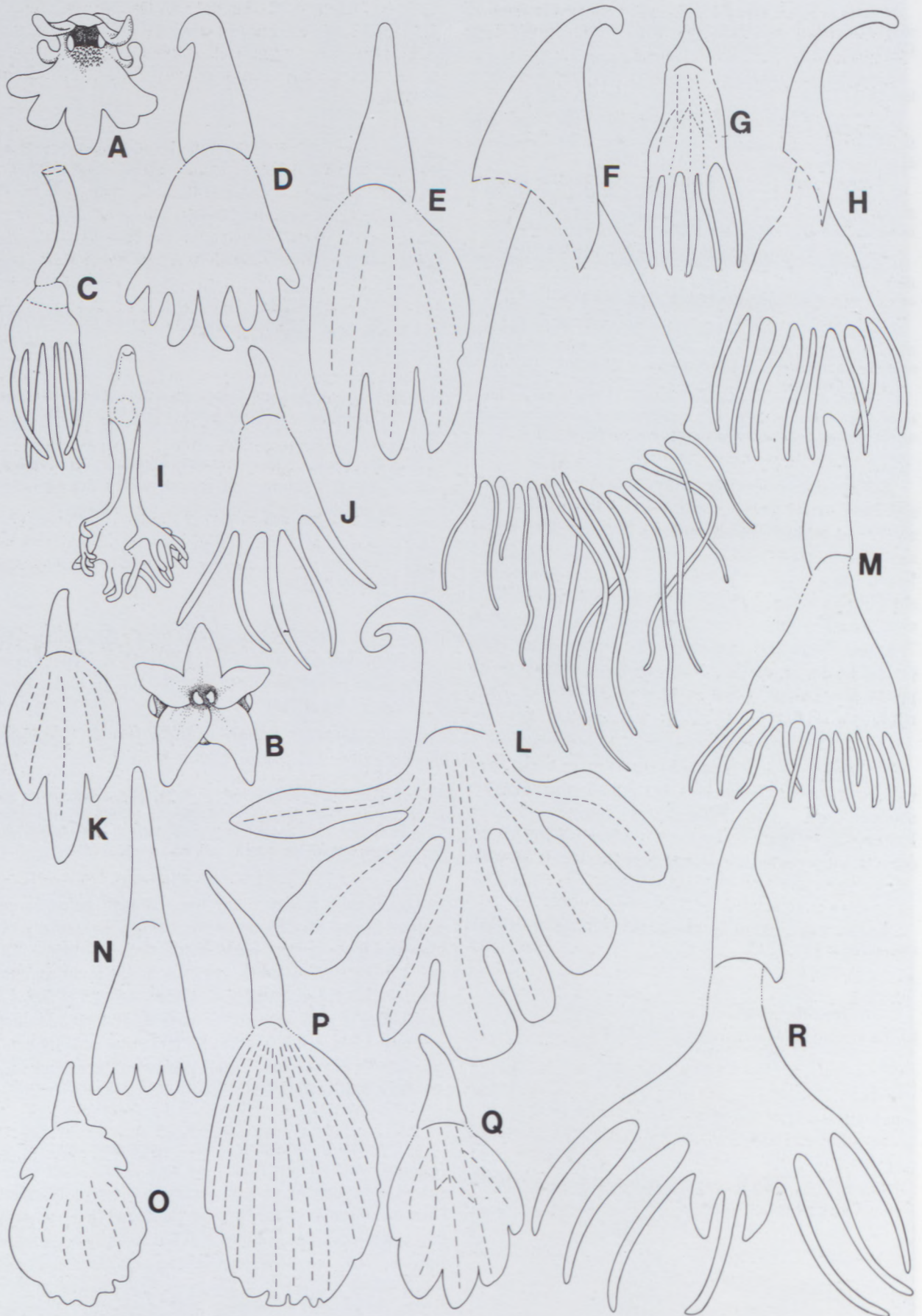


FIGURE 8.—A, B, flowers of *Holothrix*: A, *H. mundii*, A. Bean s.n., front view; B, *H. majubensis*, front view. C–R, comparison of lip shape (not drawn to scale): C, *H. filicornis*, Van der Westhuizen s.n. (only part of spur shown); D, *H. cernua*, Bolus 7022; E, *H. villosa* var. *condensata*, Esterhuysen 29418; F, *H. randii*, McLoughlin s.n.; G, *H. micrantha*, Mottley 2051; H, *H. schlechteriana*, Glass 423; I, *H. grandiflora*, Bruyns 34/76; J, *H. incurva*, Compton 21434; K, *H. thodei*, Wood 5574; L, *H. parviflora*, Gordon s.n.; M, R, *H. scopularia*, Linder 1031; N, *H. longicornu*, Cutting 69; O, *H. culveri*, Culver 84; P, *H. macowaniana*, Scully 6204; Q, *H. brevipedata*, Schelpe s.n. Drawn by G. Condy.

6b. var. **condensata** (Sond.) Immelman in Bothalia 13: 456 (1981); J.L. Stewart et al.: 61, t. 1.9b (1982). Type: Swellendam, in sand dunes, *Mund s.n.* (K, lecto!).

H. condensata Sond.: 76 (1847), Bolus: 36 (1911), Bolus: t. 12 (1918).

H. lithophila Schltr.: 446 (1898). Type: in rock crevices on mountain above Vogelgat lagoon, *Schlechter 9556* (B†, one flower at K!).

Leaves often broader than long, slightly to densely pilose with long, fine hairs. *Scape* 85–240 mm long, with long fine hairs at right angles to scape, without bracts, usually stout with inflorescence dense. *Sepals* 1.5–3.5 × 1.0–2.5 mm, glabrous to fairly densely pilose with short, fine hairs, broad, often more than half the length of petals. *Petals* entire, carnose, 3.5–7.0 × 1.5 mm, green or yellowish green; *lip* carnose, with three broadly linear lobes $\frac{1}{3}$ to $\frac{1}{2}$ length of lip (Figure 8E), lip 3.5–6.5 × 1.5–3.5 mm. *Spur* broadly conical, curved, 2.0–5.5 mm long.

H. villosa var. *condensata* has been found in the western Northern Cape, the southern Western Cape, and as far east as Humansdorp in the southern Eastern Cape (Figure 7). It grows in moist areas, and is either lithophytic or grows in shallow soil in rock crevices. Flowering time: October to January.

Vouchers: *Andrae 843* (PRE); *Esterhuysen s.n.* (BOL); *Leighton 748* (BOL); *Pillans 3508* (PRE).

7. **Holothrix majubensis** C. Archer & R.H. Archer in South African Journal of Botany 62: 209–211 (1996). Type: KwaZulu-Natal, Newcastle Dist., Majuba Mtn, sandstone cliffs on northern slopes near summit, ± 2 225 m (2729BD), 7 Jan. 1995, C. Archer & R.H. Archer 2063 (PRE, holo.!; BOL!, NH!).

Leaves, up to 35 × 25 mm, fairly thick-textured, thinly woolly on margin only. *Scape* without bracts, up to 55 mm long, with dense to sparse white, woolly hairs. *Inflorescence* dense, secund; flowers non-resupinate. *Sepals* ± 2.0 × 1.2 mm, broadly ovate, sparsely hairy. *Petals* entire, carnose, ± 2.8 × 1.0 mm, white; *lip* with undivided portion 1.5 × 2.0 mm, white (Figure 8B); lobes 3, ± equal, 1.0 × 0.6 mm. *Spur* conical, slightly recurved, 1 mm long.

To date the new species is known only from the type locality (Figure 7), where it is fairly plentiful. Archer & Archer (1996) expect that it will be found on similar northern faces of neighbouring mountains in northern KwaZulu-Natal and southern Mpumalanga. Its habitat is rather vulnerable to erosion since the plants grow in exposed soil in cracks in vertical sandstone cliffs. Flowering time: December and January.

The species is well distinct from all other known species by its non-resupinate flowers.

In the genus, the non-resupinate flowers of *Holothrix majubensis* are the main distinguishing character. It is postulated that the non-resupination is an adaptation to the pollinator: due to the inflorescences arching outwards and downwards, the flowers are placed in the correct position for pollination. Non-resupinate flowers are also known in the unrelated *Habenaria* Willd.

8. **Holothrix thodei** Rolfe in Dyer, Flora capensis 5,3: 100 (1912); J.L. Stewart et al.: 60 (1982). Type: [Orange] Free State, Witsieshoek, summit of QuaQua Mountains in stony and grassy places, 7500 ft, *Thode 48* (BOL!).

Leaves with a dense covering of small, stout, squamous hairs, withered at anthesis. *Scape* without bracts, 100–240 mm long, densely covered with stout, scabrid, reflexed hairs. *Sepals* 1.5–3.5 × 0.5–1.0 mm, with dense short hairs, usually connate. *Petals* entire, carnose, 3.5–5.0 × 0.5–1.5 mm, yellow or yellow-green; *lip* carnose, with three lobes (Figure 8K), outer pair of lobes $\frac{1}{5}$ – $\frac{1}{2}$ the length of central lobe, 2.5–4.5 × 1.5–3.5 mm, colour as for petals. *Spur* slightly curved, 0.5–2.5 mm.

This montane species occurs in Lesotho and the Drakensberg of the Free State and KwaZulu-Natal, with one record from near Engcobo, Eastern Cape (Figure 7). It is recorded from basalt-derived soils in rocky grasslands or crevices in rocks. Flowering time: January and February.

Although it has a flower very similar to *H. exilis* (No. 3), *H. thodei* has thick, scabrid hairs (squamules) on the scape like those of *H. cernua*. It also has a completely different distribution.

Vouchers: *Jacobs s.n.* (BOL); *Jacot Guillarmod, Getliffe & Mzamane 32* (PRE); *Killick 1304* (PRE); *Schelppe 297* (BOL); *Trauseld 961* (NU).

9. **Holothrix secunda** (Thunb.) Rchb.f. in Otia botanica hamburgensia 2: 119 (1881); Bolus: t. 37 (1911); J.L. Stewart et al.: 62, t. 1.13 on p. 62 [not 1.13 on p. 63 which is *H. cernua* (No. 5)] (1982). Type: *Thunberg s.n.* (UPS, holo., microfiche no. 21243 at PRE!).

Orchis secunda Thunb.: 4 (1797); Thunb.: 6 (1823).

Tryphia major Sond.: 82 (1847). Type: Brakfontein, 2000–4000 ft, *Zeyher s.n.* (K!).

Leaves glabrous, succulent. *Scape* without bracts, 45–300 mm long, slightly to densely pilose with short, fine hairs. *Inflorescence* subsecund. *Sepals* 1.5–3.5 × 1.0–2.0 mm, glabrous. *Petals* entire, carnose, adnate to lip at their bases, 2.5–7.0 × 0.5–2.0 mm, creamy white to yellowish to yellow-green; *lip* carnose, divided into five subequal lobes, lobes linear, lip with a few papillae at entrance to spur, 3.5–8.5 × 1.5–4.0 mm, colour as for petals. *Spur* slightly curved, 1.5–4.5 mm. *Column* cream and lime-green. *Anther sacs* deep reddish mauve. Figure 3G–J.

H. secunda is mainly distributed in the western Northern Cape and in Western Cape, with a few records from Eastern Cape (Figure 9). It does not, however, occur on the Cape Peninsula. It grows in dry areas in the shade of bushes, on stony soil, in rock crevices and on ledges. Flowering time: June to October.

The glabrous leaves, and the petals, which are adnate to the lip at their bases, will distinguish this species from others having a 5-lobed lip and carnose petals. Thunberg did not designate a type, but there is only one specimen

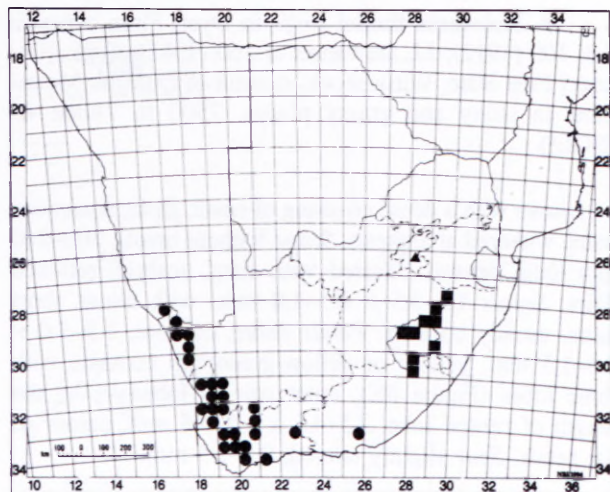


FIGURE 9.—Distribution of *Holothrix secunda*, ●; *H. incurva*, ■; and *H. micrantha*, ▲.

of this species at UPS (21243 on microfiche), which fits his description and is annotated in his hand.

Vouchers: *Acocks* 17725 (PRE); *Bruyns* 1132 (BOL); *Compton* 4329 (BOL); *Muir* 2764 (PRE).

10. *Holothrix incurva* Lindl. in Hooker's Companion to the Botanical Magazine 2: 207 (1836); Immelman: 456 (1981); J.L.Stewart et al.: 62 (1982). Type: Stockenström Div., Katberg, *Drège* 8275a (K!).

H. rupicola Schltr.: 419 (1898); Bolus: t. 40B (1911). Syntypes: Mont-aux-Sources, summit, in fissures of rocks, *Thode* 6 (not found); slopes of Mont-aux-Sources, 8000–9000 ft, *Flanagan* 11981 (BOL!).

Leaves glabrous or with a few short, scattered hairs, margins with a dense fringe of short hairs. *Scape* 72–170 mm long, densely villous with short, fine hairs at right angles to the scape, without bracts. *Sepals* 2.0–4.5 × 1.5–2.0 mm, densely villous with fine short hairs. *Petals* entire, with carinose, much-attenuated apices, 5.0–9.5 × 1.5–1.0 mm, yellow or greenish yellow; *lip* carinose, with 5 linear lobes (Figure 8J), 3.5–4.5 × 1.5–2.0 mm, yellow or greenish yellow. *Spur* broadly conical, curved, 1.0–1.5 mm long.

This montane species is distributed in the high-lying areas of the Eastern Cape, KwaZulu-Natal, the Free State and Lesotho (Figure 9), and grows on basalt ledges and rocky crevices. Flowering time: December to April.

Vouchers: *Hilliard & Burt* 9803 (NU); *Prescott* s.n. (BOL); *Schelp* 7677 (BOL); *Stewart* 1947 (NU).

11. *Holothrix micrantha* Schltr. in Botanische Jahrbücher 20, Beihefte 50: 31 (1895); J.L.Stewart et al.: 61 (1982). Type: mountains above Heidelberg, on grassy cliffs, 5400 ft, *Schlechter* 3522 (B†).

Leaves pilose, withered at anthesis. *Scape* without bracts, 72–170 mm long, with long, straight hairs. *Sepals* 1.5–2.0 × 0.5–1.0 mm, with a few hairs at apices. *Petals* entire, with carinose apices, 3.0–4.5 × 0.5–1.0 mm; *lip* carinose, divided into five linear, acute lobes (Figure 8G), 3.5–4.5 × 1.5–2.0 mm. *Spur* broadly conical, curved, 1.0–1.5 mm long.

The type, collected at Heidelberg in Gauteng, was not seen; it was probably destroyed in Berlin. Three other specimens exist which match the description of *H. micrantha*: two from Killarney near Johannesburg (PRE!, J!) the J specimen from a marsh (Figure 9), and one from Modderfontein (K!). The description is taken from the Killarney specimen. Flowering time: September and October.

This rare species is very similar to *H. incurva* (No. 10) but is smaller, has a slightly denser spike, and a different distribution and flowering time. When more specimens are found, it may prove to be only a variant of that montane species.

Voucher: *Mottley* 2015 (J).

12. *Holothrix filicornis* Immelman & Schelpe in Immelman in Bothalia 13: 455 (1981); J.L.Stewart et al.: 64, t. 1.16 (1982). Type: Namaqualand, 23 km west of Springbok, *Acocks* 19269 (BOL, holo.!, PRE!, K!).

Leaves glabrous, large. *Scape* without bracts, 65–260 mm long, glabrous. *Sepals* ovate, acute, 1.5–2.0 × 0.5–1.0 mm, glabrous, green tinged with red. *Petals* with three filiform lobes $\frac{1}{2}$ – $\frac{2}{3}$ as long as petals; petals 3.0–8.0 × 0.5–1.0 mm, greenish white; *lip* 4.5–9.0 × 1.5–2.5 mm, greenish white, divided into five filiform lobes (Figure 8C), lobes comprising $\frac{2}{3}$ – $\frac{3}{4}$ of total lip length. *Spur* slightly curved and pendulous, 1.25–2.0 times length of lip, 7–11 mm long. *Ovary* twisted, green tinged with red.

H. filicornis occurs in northern Namaqualand (Northern Province), growing in the shelter of rocks and shrubs on mountainsides (Figure 10). Flowering time: June to September.

This species, together with the montane *H. scopularia* (No. 13), is unusual among the species of South African *Holothrix* in having divided petals, but no bracts on the scape. The two species always have three-lobed petals, instead of the variable number of petal lobes of the other species with divided petals and a bracteate scape. The extremely long spur, the different distribution and habitat, and the less strongly secund spike of *H. filicornis*, how-

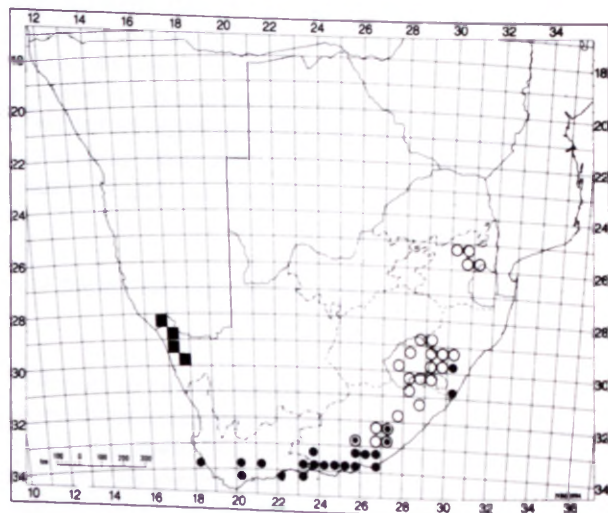


FIGURE 10.—Distribution of *Holothrix filicornis*, ■; *H. scopularia*, ○; and *H. parviflora*, ●.

ever, make it easy to distinguish this species from *H. scopularia*.

Vouchers: *Oliver, Tölken & Venter 652, 702, 823* (PRE); *Tölken 3293* (BOL); *Van der Westhuizen s.n.* (in liquid preservative in BOL, labelled H.M.F. 20 and 21); *Williamson 2562, 2565* (BOL).

13. *Holothrix scopularia* (Lindl.) Rchb.f., in *Otia botanica hamburgensia* 2: 119 (1881); Schltr.: 21 (1899a) partly, excl. *H. pleistodactyla*; Bolus: 38 (1911); Immelman: 456 (1981); J.L.Stewart et al.: 64, t. 1.17 (1982). Type: Witbergen summit, 6000 ft, *Drège 8275b* (K! lecto., here designated; P!).

Scopularia secunda Lindl.: 207 (1836) non *Orchis secunda* Thunb. (1823).

H. multisecta Bolus: 170, 190, t. 7 (1890); T.Durand & Schinz: 71 (1895), as *H. multiseta*. Type: Stockenstrom, Elandsberg summit, *Scully 391* (K!, BOL!).

H. burchellii sensu Kraenzl.: 589 (1899) non Lindl. (1835).

Leaves moderately to densely pilose with long, straight, slender hairs, often withered at anthesis. *Scape* without bracts, 110–340 mm long, densely pilose with long, straight, slender hairs at right angles to scape. *Inflorescence* strongly secund. *Sepals* 1.5–4.0 × 1.0–2.0 mm, glabrous or with a few long hairs. *Petals* three-lobed, 3.0–11.0 × 0.5–2.5 mm, cream or pinkish cream, sometimes wine-coloured; *lip* 5–12-lobed (Figure 8M, R), 2.0–13.0 × 1.5–4.5 mm, colour as for petals. *Spur* curved, 1.0–4.5 mm long.

H. scopularia occurs in the high mountain areas of the Eastern Cape, KwaZulu-Natal and Lesotho, and also (disjunctly) in Mpumalanga (Figure 10). It grows on grassy slopes and rocky outcrops, and flowers from September to January.

Vouchers: *Dieterlen 1301* (PRE); *Galpin s.n.* (BOL); *Schelphe 7159* (BOL); *Sim 1267* (PRE); *Stewart 1825* (NU).

14. *Holothrix parviflora* (Lindl.) Rchb.f., *Otia botanica hamburgensia*: 119 (1881); Immelman: 456 (1981); J.L.Stewart et al.: 63 (1982). Type: Swanepoelspoort Mountains, 3000–4000 ft, *Drège 8276a* (K!).

Tryphia parviflora Lindl.: 209 (1836). *H. lindleyana* var. *parviflora* (Lindl.) Rolfe: 106 (1912).

T. secunda Lindl.: 209 (1836) non *Orchis secunda* Thunb. (1823). *H. lindleyana* Rchb.f.: 119 (1881); Bolus: t. 35 (1911). Type: Koratara (Karatara?), *Drège s.n.* (K!).

Leaves glabrous, succulent. *Scape* without bracts, 70–240 mm high, glabrous. *Sepals* 1.5–3.5 × 0.5–1.5 mm, glabrous. *Petals* entire, membranous in texture, adnate to lip at base, 3.0–6.5 × 0.5–1.5 mm, pure white or flushed with purple at base; *lip* 3.5–9.0 × 0.5–1.5 mm (breadth taken at base of three central lobes), pure white or with pale purple lines and throat, membranous, divided into five lobes, the outer pair of lobes broadly linear, inner three shorter, broadly linear to nearly rectangular (Figure 8L). *Spur* narrowly conical, circinnate, 1.5–5.5 mm long.

H. parviflora occurs from around the Cape Peninsula (Western Cape) to Stutterheim (Eastern Cape), then (disjunctly) in southern KwaZulu-Natal (Figure 10). It grows in damp places and on mossy boulders, usually in a shel-

tered position or under bushes and trees, and has also been recorded from rocks just above high tide (at Knysna). Flowering time: July to November.

The circinnate spur and the petals which are basally adnate to the lip, are characteristic of this species.

Vouchers: *Bayliss 35/1562* (PRE); *Long 1018* (PRE); *McLoughlin s.n.* (BOL); *Parker 1059* (BOL); *Sim 950* (NU).

15. *Holothrix orthoceras* (Harv.) Rchb.f., *Otia botanica hamburgensia*: 119 (1881); Bolus: t. 23 (1911); J.L.Stewart et al.: 62, t. 1.11 (1982). Type: Howieson's Poort, and on the Katberg, *Hutton s.n.* (TCD!, lecto., here designated; K!).

Tryphia orthoceras Harv.: 4, t. 105 (1863).

Leaves glabrous, reticulated with white or silver. *Scape* without bracts, 60–280 mm long, densely pilose with fine, short hairs. *Sepals* 1.5–3.5 × 0.5–1.0 mm, glabrous. *Petals* entire, membranous, base of each petal rolled into a tube with its edge hooked into edge of opposite petal, 3.5–7.5 × 1.0–2.0 mm, white, apices attenuate; *lip* papillate at entrance to spur, 4.0–8.5 × 2.0–5.5 mm, white with or without purple veins, membranous, divided into five to many lobes, outer pair of lobes broadly linear and acute, two or more times as long as triangular central lobes. *Spur* acute, straight, 2.5–6.5 mm long. *Anther sacs* purple. Figure 5E–H.

This fairly common species occurs in forests in the Eastern Cape, KwaZulu-Natal, Mpumalanga and the Northern Province (Figure 11). Flowering time: March to May, but also occasionally in October and November.

H. orthoceras is similar to the rarer *H. macowaniana* (No. 18) but differs in having silver-veined leaves and a longer outer pair of lobes on the lip. It is also often confused with *H. parviflora*, but its straight spur, and the triangular rather than rectangular lobes in the centre of the lip, will distinguish it.

Vouchers: *Allsop s.n.* (PRE); *Bokelmann s.n.* (PRE); *Botha s.n.* (PRE); *Hilliard & Burt 6519* (NU); *McLoughlin 626* (BOL).

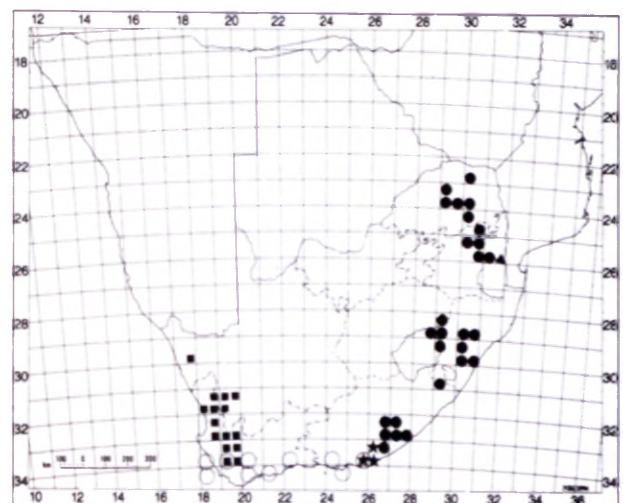


FIGURE 11.—Distribution of *Holothrix orthoceras*. ●, *H. aspera*, ■, *H. mundii*, ○, *H. macowaniana*, ★, and *H. culveri*, ▲.

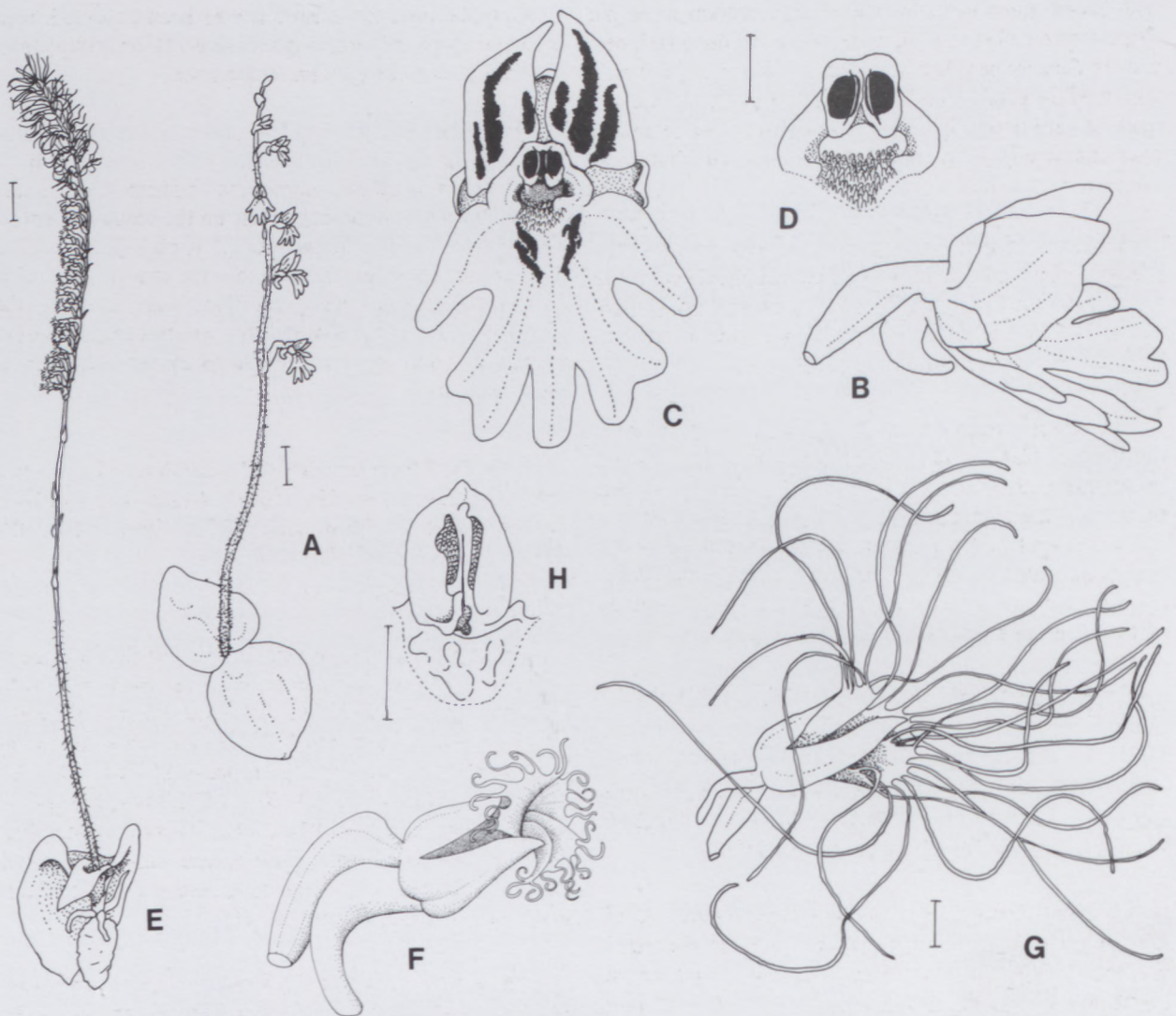


FIGURE 12.—A–D, *Holothrix aspera*, Schelpe s.n.: A, habit; B, flower, side view; C, flower, front view; D, column, front view. E–H, *H. burchellii*: E, habit, A. Bean 142; F, flower from base of spike, Seagrief s.n.; G, flower, $\frac{3}{4}$ way up spike, Seagrief s.n.; H, column, front view. Drawn by K. Immelman. Scale bars: A, E, 10 mm; B–D, F–H, 1 mm.

16. *Holothrix mundii* Sond. in *Linnaea* 19: 77 (1847); Bolus: t. 13 (1896); Bolus: t. 10 (1918); J.L. Stewart et al.: 60, t. 1.2 (1982). Syntypes: Swellendam area, *Mund* s.n. (K!), and in Worcester area, Winterhoekberge, 4000–5000 ft, among ericas, *Zeyher* s.n.

Leaves glabrous, small. *Scape* without bracts, 60–160 mm long, with short, fine, slightly reflexed hairs. *Inflorescence* condensed (Figure 8A). *Sepals* 1.0–2.0 × 0.3–0.5 mm, glabrous. *Petals* entire, membranous, 1.5–2.5 × 0.3–0.5 mm, white; *lip* membranous, divided into seven lobes on the same pattern as *H. aspera* (central lobe and outer pair longer than other four lobes), papillate at entrance to spur, 1.5–3.5 × 0.5–2.0 mm, white. *Spur* straight, 0.5–1.5 mm long. *Column* very short, green. *Anther sacs* bright pinkish mauve.

H. mundii is distributed from the Cape Peninsula through the southern Western and Eastern Cape as far east as Port Elizabeth (Figure 11). Flowering time: September to November.

H. mundii is very similar to *H. aspera* (No. 17) in the shape of its lip, but can easily be distinguished by the

condensed inflorescence, as well as by the smaller flowers and straight spur. It is one of the smallest species in southern Africa, and the only one with a condensed inflorescence.

Vouchers: Bolus 4971 (PRE); Esterhuysen 19033 (BOL); Fair s.n. (BOL); Muir s.n. (PRE).

17. *Holothrix aspera* (Lindl.) Rchb.f., *Otia botanica hamburgensia*: 119 (1881); Bolus: 19B (1913); Immelman: 456 (1981); J.L. Stewart et al.: 63, t. 1.15 (1982). Type: Namaqualand, between Mierenkasteel and Zwartdoornrivier (13 miles south of Garies), Drège 8276b (K!).

Bucculina aspera Lindl.: 209 (1836).

Holothrix confusa Rolfe: 105 (1912). Syntypes: mountainsides about Clanwilliam, Leipoldt in MacOwan & Bolus s.n. (Herb. Norm. Aust. 1757); stony places on Blaauberg, Schlechter 8465 (K!, BOL!); near Oliphant's River Mountains, Schlechter 5036 (K!); near Piekenierskloof and near Modderfontein, Schlechter 5077; Hex River Valley, Wolley Dod 4054 (K!, BOL!).

Leaves glabrous. *Scape* without bracts, 30–250 mm long, nearly glabrous to moderately pubescent with short, fine hairs. *Sepals* 1.0–3.5 × 0.8–2.5 mm, glabrous. *Petals* entire, broad, membranous, 3.5–6.5 × 1.0–4.0 mm, white

with bright green bases and two broad maroon or purple stripes; *lip* membranous, divided into seven unequal lobes, usually densely papillate at throat, 3.0–8.5 × 1.0–6.0 mm, colour as for petals. *Spur* very broad, strongly curved and bent forward under lip, 2.0–5.0 mm long. *Column* arched over entrance to spur, lime-green. *Anther sacs* purple or maroon. Figure 12A–D.

A species of semi-arid areas, *H. aspera* occurs in the Western Cape and in southern Namaqualand, with one record from the Springbok District, Northern Cape (Figure 11). It is found in sandy or rocky ground or in crevices in rocks. Flowering time: June to October.

This species cannot be confused with any other from the Western Cape or the Namaqualand area. The column differs from the usual state in *Holothrix*, forming an open arch across the mouth of the spur. The lip is densely papillate under and in front of this arch. The attitude of the spur is also unique, being doubled up like a penknife under the spur (and also curved), rather than gently curved or circinnate as in other species.

Vouchers: *Acocks* 17032 (PRE); *Bolus* s.n. (BOL); *Esterhuysen* 3394a (BOL), 5567 (PRE).

18. *Holothrix macowaniana* *Rchb.f.* in *Otia botanica hamburgensia* 2: 108 (1881). Type: Bedford Div., Kagaberg, *Weale* s.n., sent by MacOwan (BOL, lecto!; K!).

Leaves glabrous, small. *Scape* without bracts, 50–60 mm long; glabrous or with short, fine hairs at right angles to scape. *Sepals* 1.5–3.0 × 0.5 mm, glabrous. *Petals* entire, membranous, with attenuate apices, 3.0–4.5 × 0.5–1.5 mm, white; *lip* 5.5–6.5 × 2.5–5.5 mm, white, membranous, divided into very shallow, broad, triangular lobes, number of lobes indeterminate (Figure 8P). *Spur* narrowly conical, straight, 3.5–6.5 mm long.

This small and probably not very common species has a restricted distribution in the forests of the southern Eastern Cape (Figure 11). Flowering time: August to October.

Vouchers: *Glass* 6204b (BOL); *MacOwan* s.n. (BOL); *Scully* s.n. (20503 in SAM).

19. *Holothrix culveri* *Bolus* in *Transactions of the South African Philosophical Society* 16: 147 (1905); *Immelman*: 456 (1981); *J.L. Stewart et al.*: 61 (1982). Type: near Barberton, Fig Tree Creek, on rocky slopes, 2000 ft, Sept. 1890, *Culver* 84 (BOL!).

Deroemera culveri (Bolus) *Schltr.*: 144 (1907).

H. culveri var. *integra* *Bolus*: 147 (1905). Type: Barberton, *Culver* 84a (BOL!, K!).

Leaves withered at anthesis, apparently only one present. *Scape* with bracts, slender, ± 140 mm long, with a few short hairs at base. *Sepals* 2.5 × 0.8 mm, glabrous. *Petals* entire, membranous, oblong, 4.0 × 1.5 mm, white; *lip* membranous, entire or with small acute lobe on either side of broadly oval central limb (Figure 8O), 3.5 × 3.0 mm, white. *Spur* straight, acute, half as long as lip, 1.5 mm long.

Only the type specimen has ever been collected, from near Barberton, Mpumalanga (Figure 11), on rocky slopes at 2000 ft. Flowering time: September.

Voucher: type only.

H. culveri is unique among the southern African species of *Holothrix* in having bracts on the scape and entire, delicate petals. *H. squammata* (A.Rich.) *Rchb.f.* from Uganda and Ethiopia, however, has the same combination of characters. *Bolus* states that there were spurs on the side-sepals of *Culver* 84a, but this was not seen; possibly a strip of tissue was torn off the ovary when the sepals were dissected.

20. *Holothrix burchellii* (*Lindl.*) *Rchb.f.* in *Otia botanica hamburgensia*: 119 (1881); *Bolus*: t. 39 (1911); *J.L. Stewart et al.*: 66, t. 1.22 (1982). Type: Zoetmelks Rivier, *Burchell* 6709 (K!).

Scopularia burchellii *Lindl.*: 304 (1835).

Leaves glabrous. *Scape* with bracts, 150–500 mm long, with short, deflexed hairs, stout. *Inflorescence* secund, with dimorphic flowers. *Sepals* 2.5–5.0 × 1.0–2.5 mm, glabrous. *Petals* divided at apex into 5–10 filiform lobes, longer on upper than lower flowers of spike, petals 3.5–18.0 × 1.0–3.5 mm, cream-coloured; *lip* 3.0–9.0 × 1.5–4.0 mm, cream-coloured, divided into 5–13 lobes, lobes longer on upper than on lower flowers of spike. *Spur* curved, smaller on upper than lower flowers, 3.0–6.0 mm long. *Anther sacs* pale chestnut to tan in colour. Figure 12E–H.

This species occurs in the Western Cape at Piketberg, and then at Bredasdorp and from there as far east as the Queenstown and Stutterheim Districts in Eastern Cape (Figure 13). Flowering time: August to November.

A striking feature of *H. burchellii* is the dimorphic flowers, the upper having greatly elongated petal and lip lobes compared to the lower. The spur and column of the upper flowers are smaller, but in the same proportion to the size of the flower (excluding the lobes of lip and petals) as in the lower flowers. The upper flowers are said to be sterile, but the author has seen them produce cap-

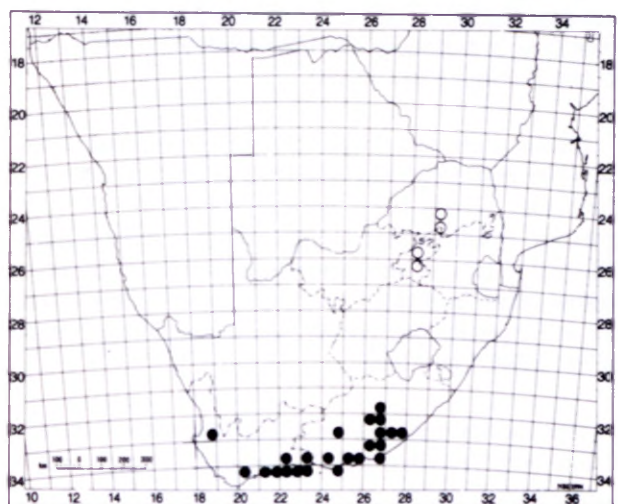


FIGURE 13.—Distribution of *Holothrix burchellii*, ●; and *H. randii*, ○.

sules with seed in them, and the column and pollinia are no different in structure from those of the lower flowers.

Also, although the flowers are generally described as 'dimorphic' this is not strictly correct, as the transition from short- to long-lobed flowers is not abrupt, and there are about four or five intermediate flowers.

Vouchers: *Bolus 11382* (BOL); *Schelpe 7133* (BOL); *Schlieben & Ellis 12387* (PRE); *Sidey 1255* (PRE).

21. *Holothrix randii* Rendle in *Journal of Botany, British and Foreign* 37: 208 (1899); Summerh.: 11 (1968); J.L.Stewart et al.: 65, t. 1.19 (1982); Kidson & Fletcher: 14 (1984). Type: Rhodesia, Salisbury [Zimbabwe, Harare], in shady woods, *Rand 596* (BM!).

H. reckii Bolus: t. 21 (1913). Type: Transvaal (Gauteng), Koedoespoort, *Reck 1003* (BOL., PRE!).

Leaves glabrous, withered at anthesis. *Scape* with bracts, 170–420 mm long, minutely pilose with short, fine, sinuous hairs. *Sepals* 2.5–4.5 × 1.5–2.0 mm, glabrous. *Petals* divided into 7–11 fine, filamentous lobes, 6.0–13.5 × 3.0–5.0 mm, white; *lip* divided into 8–15 fine, filamentous lobes (Figure 8F), 10.0–13.5 × 3.0–6.0 mm, white. *Spur* curved to nearly circinnate, 3.5–8.0 mm long.

This species is found at Zebediela (Northern Province) and in Gauteng in the districts of Pretoria and Johannesburg (Figure 13), and occurs also in Tanzania and Zimbabwe. It grows on grassy slopes and rocky ledges. Flowering time: September to December.

H. randii is very similar to *H. schlechteriana* (No. 22) but differs in the fine, hair-like lobes of the lip and petals, in its white (not cream or greenish) petals, and in its distribution. It also tends to have a more strongly curved spur but this does not hold for all specimens.

Vouchers: *Bolus 14082* (BOL); *Codd 6162* (PRE); *Howlett s.n.* (PRE); *McLoughlin 144* (BOL).

22. *Holothrix schlechteriana* Schltr. ex Kraenzl. in *Orchidacearum genera et species*: 588 (1899); Bolus: t. 20 (1913); J.L.Stewart et al.: 65 (1982). Syntypes: rocky area near Clarkson, 5000 ft, *Schlechter 6015* (K!); Queens-town Dist., in mountains near Howieson's Poort, 2000–3000 ft, *Mrs Barber s.n.* (not found).

Leaves glabrous, large. *Scape* with bracts, stout, 135–700 mm long, moderately to densely pilose with short, fine, velvety hairs. *Sepals* 2.0–6.0 × 0.5–2.5 mm, glabrous. *Petals* divided at apex into 4–9 filiform lobes, 2.5–10.0 × 1.0–2.5 mm, green to pale greenish cream to yellow-ochre; *lip* divided into 5–11 lobes (Figure 8H), colour as for petals. *Spur* curved, half to nearly equal length of lip, 2.5–5.5 mm long.

This species occurs in a number of scattered localities. It has been recorded from Springbok in the Northern Cape, from Caledon, Montague and Laingsburg, in the Western Cape and it extends into Eastern Cape as far as Steynsburg and King William's Town (Figure 14). It

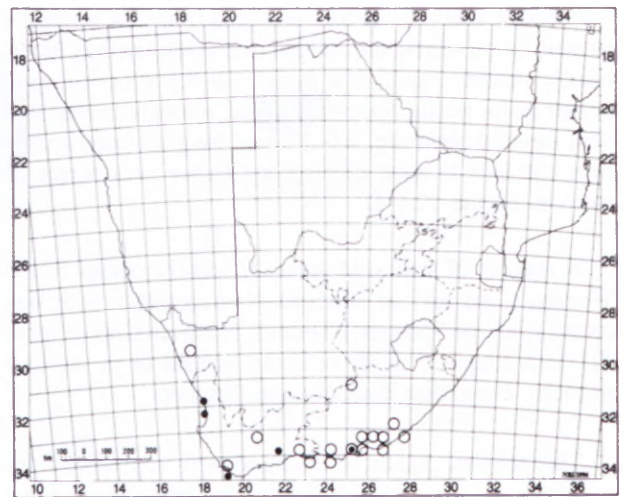


FIGURE 14.—Distribution of *Holothrix schlechteriana*, ○, and *H. grandiflora*, ●.

grows in dry areas shaded by rocks or bushes. Flowering time: October to February.

For characters distinguishing this species from *H. randii* (No. 21), see under that species.

Vouchers: *Acocks 12071, 16511* (PRE); *Ehrens 1962* (PRE); *Hardy & Bayliss 1115* (PRE); *Theron 1399* (PRE).

23. *Holothrix grandiflora* (Sond.) Rchb.f. in *Otia botanica hamburgensis*: 119 (1881); J.L.Stewart et al.: 65, t. 1.21 (1982). Type: Uitenhage, *Wiedemann s.n.* (not found).

Scopularia grandiflora Sond.: 79 (1847).

Leaves glabrous, large, often withered at anthesis. *Scape* with bracts, stout, 190–510 mm long, glabrous or with a few minute hairs at base. *Sepals* 4.5–9.0 × 1.5–4.5 mm, glabrous. *Petals* divided into 5–9 lobes, 10.0–22.0 × 1.5 mm, white with bases green or pale lilac; *lip* 12.5–25.5 × 3.5–6.5 mm (breadth taken at base of flared section), divided into 13–26 lobes (Figure 8I); limb often flared out into a broad distal section; colour as for petals. *Spur* very broadly conical, slightly curved, 1/5–1/4 length of lip, 3.0–4.5 mm long. *Column* with an apiculus.

The records for this species are scattered, and come from the west coast, from Bredasdorp, and from Ladismith in Western Cape and from Port Elizabeth (the type) in Eastern Cape (Figure 14). It grows in hollows and crevices in rocks, under semi-arid conditions. Flowering time: March.

H. grandiflora, the tallest representative of the genus in southern Africa, is similar to *H. schlechteriana*. It can usually be distinguished by the shorter spur to lip ratio, the longer petals, and the nearly glabrous scape; it also generally has a larger number of lip lobes and a flared distal section of the lip. The flowering time is later, being in March, while *H. schlechteriana* flowers mainly from October to December and occasionally in January and February.

Although the type has not been seen, the description by Sonder (1847) is detailed and clearly refers to this species.

Vouchers: *Brayns* 1282 (NBG); *Guthrie s.n.* (BOL); *Hall 3521c* (BOL); *Schelppe* 7663 (BOL).

REFERENCES

- ARCHER, C. & ARCHER, R.H. 1996. A new species of *Holothrix* Lindl. (Orchidaceae) from northern KwaZulu-Natal. *South African Journal of Botany* 62: 209–211.
- BENTHAM, G. & HOOKER, J.D. 1883. *Genera plantarum* 3: 623, 624. Black, London.
- BOLUS, H. 1888. Orchids of the Cape Peninsula. *Transactions of the South African Philosophical Society* 5,1: 75–200.
- BOLUS, H. 1890. Contributions to South African botany IV (with a revised list of published species of extratropical South African orchids). *Journal of the Linnean Society* 25: 156–209.
- BOLUS, H. 1896. *Icones orchidearum austro-africanarum extra-tropicarum* 1: t. 13, 14a. Wesley, London.
- BOLUS, H. 1905. Contributions to the African Flora. *Transactions of the South African Philosophical Society* 16: 135–152.
- BOLUS, H. 1911. *Icones orchidearum austro-africanarum* 2: t. 34–40. Wesley, London.
- BOLUS, H. 1913. *Icones orchidearum austro-africanarum* 3: t. 17–21. Wesley, London.
- BOLUS, H. 1918. *Orchids of the Cape Peninsula*, 2nd edn: 16–23, t. 10–14. Darter, Cape Town.
- BURMAN, N.L. 1768. *Prodromus florae capensis*: 30 (26). Comelius Haak, Amsterdam.
- DURAND, T.A. & SCHINZ, H. 1895. *Conspectus florae Africae* 5: 69–73. Jardin Botanique de l'Etat, Brussels.
- DYER, R.A. 1976. *Holothrix. The genera of southern African flowering plants* 2: 989. Department of Agricultural Technical Services, Pretoria.
- HOOKE, J.D. 1837. *Hooker's Icones plantarum* 2: t. 103A, B.
- HARVEY, W.H. 1863. *Tryphia orthoceras. Thesaurus capensis* 2: 4, t. 105. Hodges & Smith, Dublin.
- IMMELMAN, K.L. 1981. Notes on South African species of *Holothrix*. *Bothalia* 13: 455, 456.
- KIDSON, S. & FLETCHER, E. 1984. Our heritage: South African orchid species (*H. randii*). *South African Orchid Journal* 15,1: 14, 15.
- KRAENZLIN, F.W.L. 1899. *Orchidacearum genera et species* 1: 588, 589. Meyer & Mueller, Berlin.
- LEWIS, G.J. 1938. A new orchid. *Journal of South African Botany* 4: 53.
- LINDLEY, J. 1834. *Scopularia, Monotris. Edward's Botanical Register*, new ser. 7: t. 1701.
- LINDLEY, J. 1835. *Holothrix. The genera and species of orchidaceous plants*: 283, 302–304. Ridgways, London.
- LINDLEY, J. 1836. Notes upon some genera and species of Orchidaceae in the collection formed by Mr Drège, at the Cape of Good Hope. *Hooker's Companion to the Botanical Magazine* 2: 200–210.
- LINNAEUS, C. (fil.). 1782 ('1781'). *Supplementum plantarum systematis vegetabilium*: 401. Impensi orphanotrophei, Brunsvigae.
- REICHENBACH, H.G. (fil.). 1852. *De pollinis Orchidacearum*: 29. Hofmeister, Leipzig.
- REICHENBACH, H.G. (fil.). 1881. *Otia botanica hamburgensia*: 108, 119. Meissner, Hamburg.
- RENDLE, A.B. 1895. Mr Scott-Elliott's tropical African orchids. *Journal of Botany, British and Foreign* 33: 277–278.
- RENDLE, A.B. 1899. *Holothrix randii*. In R.F. Rand, Wayfaring notes in Rhodesia III. *Journal of Botany, British and Foreign* 37: 204–208.
- ROLFE, R.A. 1912. *Holothrix. Flora capensis* 5.3: 96–111. Reeve, London.
- SHELPE, E.A.C.L.E. 1966. *Orchid Review* 74: 394.
- SHELPE, E.A.C.L.E. 1977. A review of the summer rainfall species of *Holothrix* in South Africa. *South African Orchid Journal* 8,1: 5, 6.
- SCHLECHTER, F.R.R. 1895. Beiträge zur Kenntnis neuer und kritischer Orchideen aus Südafrika. *Botanische Jahrbücher* 20, Beihefte 50: 1–46.
- SCHLECHTER, F.R.R. 1898. Revision der Gattung *Holothrix*. *Oesterreichische Botanische Zeitschrift* 11: 443–446.
- SCHLECHTER, F.R.R. 1899a. Revision der Gattung *Holothrix*. *Oesterreichische Botanische Zeitschrift* 12: 12–21.
- SCHLECHTER, F.R.R. 1899b. Orchidaceae africanae. *Botanische Jahrbücher* 26: 330–344.
- SCHLECHTER, F.R.R. 1907. Orchidaceae africanae 4. *Botanische Jahrbücher* 38: 144–165.
- SONDER, O.W. 1847. Enumeratio Orchidacearum quas in Africa australi extratropica collegerunt C.F. Ecklon, Dr., et C. Zeyher. *Linnaea* 19:71–124.
- STEWART, J.L., LINDER, H.P., SCHELPE, E.A. & HALL, A.V. 1982. *Wild orchids of southern Africa—Holothrix*: 58–66. Macmillan, Johannesburg.
- SUMMERHAYES, V.S. 1968. Orchidaceae (Part 1). *Flora of tropical East Africa* 156: 5–13.
- THUNBERG, C.P. 1794. *Orchis. Prodromus plantarum capensium* 4. Edman, Uppsala.
- THUNBERG, C.P. 1823. *Flora capensis*: 6. Cotta, Stuttgart.

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