A —

CONTRIBUTIONS TO THE SYSTEMATICS OF THE GENUS S C H I Z O C H I L U S

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of the requirements for the degree of
B.Sc. Hons. (Botany) at the
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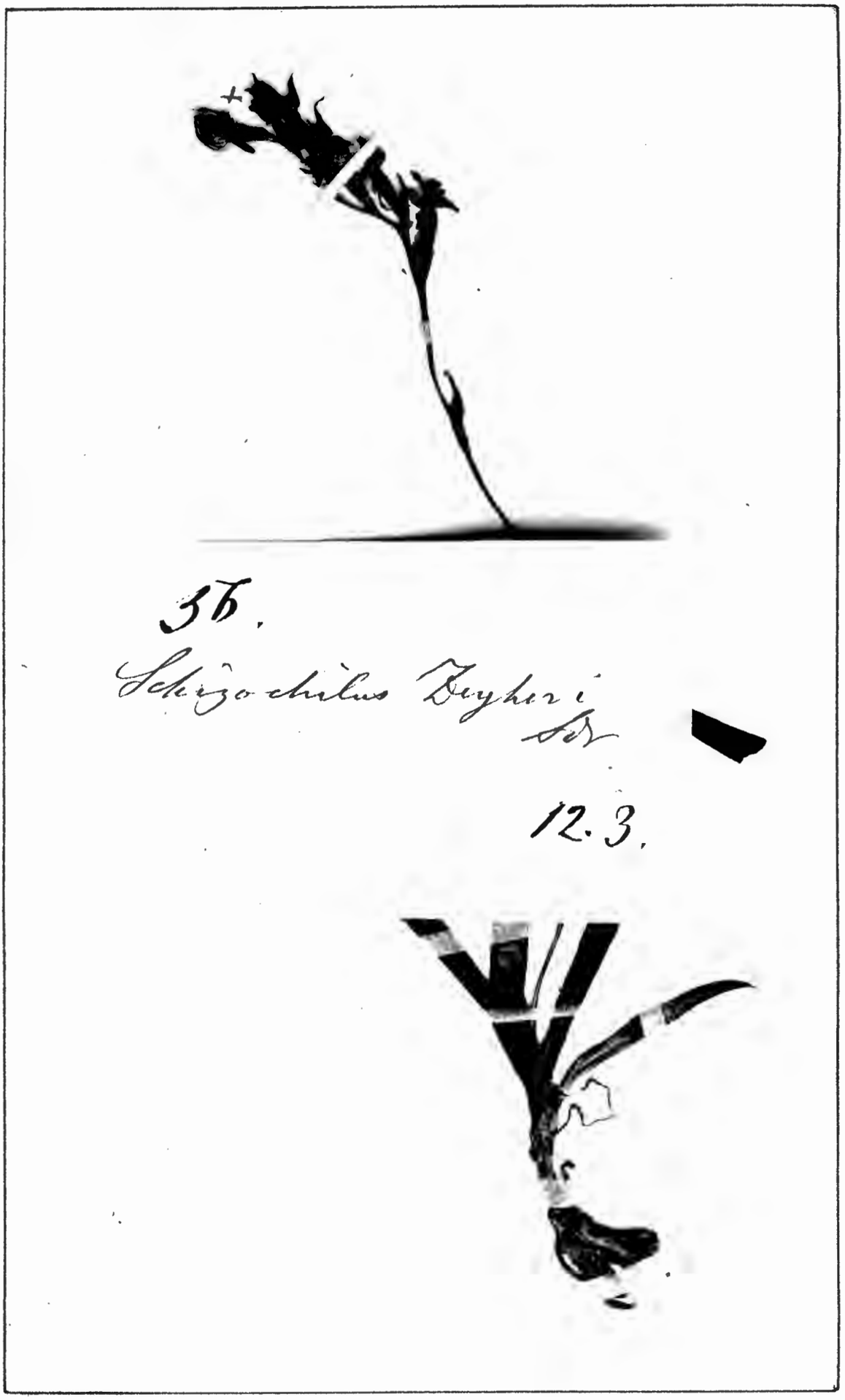
M. MacRobert

ACKNOWLEDGMENTS

My thanks are due to Professor E. A. Schelpe for his guidance, and for procuring from Kew, Melbourne and several South African herbaria the additional *Schizochilus* material used in these investigations; also to Dr. A. V. Hall, particularly for the computerized specimen list in geographical grid order.



Schizochilus zeyheri Sond.

Royal Botanic Gardens,
MELBOURNE.

X 1½

I N D E X

CONTRIBUTIONS TO THE SYSTEMATICS OF THE GENUS SCHIZOCHILUS

The genus Schizochilus, first described by Sonder in 1847 as an extra-tropical Southern African orchid, is based upon material collected by Ecklon and Zeyher in moist places in the Winterberg mountains. The main characters of the flower are a spurred, fleshy three-cleft lip; and free, erect sepals and petals, all three sepals being equal and the petals much smaller than the sepals. The type species, S. zeyheri Sond., is described as having a small number (2-3) of linear-oblong basal leaves and a spike of 16-20 small flowers. Sepals and petals are both noted as white, the sepals about 0,5 cm in length (2½ lines) and marked with 3 rosy veins, the petals lanceolate and half the length of the sepals. The spur is "not much shorter than the labellum" and the ovary "almost twice the length of the spur". The lip itself, obovate in outline, is covered with very small crystalline papillae, the lateral lobes being "somewhat shorter than the broader, obtuse intermediate lobe". There appears to be no mention of the basal tubercles or calli on the lip.

The next three species of Schizochilus to be recognized, viz. S. bulbinella (Rchb. f.) Bolus, S. gerrardi (Rchb. f.) Bolus and S. cecili Rolfe, are reasonably distinct from one another. S. cecili and S. bulbinella are small-flowered species in which the spur is extremely short, minimal by comparison with the lip; and there are no calli on the lip of S. bulbinella. In relation to the larger flowers

of S. zeyheri, those of S. gerrardi are of medium size. So also are those of S. lepidus Summerh., a recently named Rhodesian species of similar appearance to S. gerrardi.

S. pulchellus Schltr. and S. rudatisii Schltr. are another two taxa with flowers of medium size. Both are based on very limited and localized collectings.

S. albiflos Schltr., with a small to medium-sized flower, and a rather broad lip, may possibly constitute a link between small and large-flowered Schizochilus groups.

Subdivision of the large-flowered S. zeyheri complex, first by Rolfe and subsequently, to an even greater extent, by Schlechter, is based largely on divergences from Sonder's description of the species. Such properties as colour, length of sepals, shape of petals, and different proportional relationships between ovary, spur and lip and between the lateral and intermediate lobes of the labellum, have all been used to construct new species. While one sometimes wonders how carefully Rolfe examined specimens, Schlechter obviously looked at his material only too closely, his discoveries driving him to an inordinate amount of reclassification. When the critical feature of a distinguishing character fails to appear in flowers selected at random from the type sheets, to differentiate between other specimens according to a particular state of the same character is surely illogical. It is most unlikely that there really are such separate entities as S. baurii and S. caffrus, and

it seems unnecessary to have created S. clavatus and S. bolusii when S. strictus Rolfe was already there. Petals of different shape, and lip lobes with other proportional relationships to those indicated by Schlechter, have been observed in many of the types, suggesting that S. zeyheri is indeed, as Bolus supposes, "a very variable species" showing many differences in the same population.

For this project, flower parts have been dissected out and mounted from a fairly representative selection of the Schizochilus material available which includes the majority of the type specimens. Outlines were traced under a drawing microscope at a magnification of 6; in the case of type specimens a magnification of 12 was also used for the lip. Where, on the sketches, the colour of the flower is indicated in brackets, this information has been obtained from the text, and not from the herbarium sheet label.

As yet, it is only tentatively suggested, though strongly suspected, that the specific name Schizochilus zeyheri covers all large-flowered forms in the genus (with the possible exception of the first of the two undescribed Transvaal taxa at the end). Many specimens, particularly the more northerly ones, have still to be dissected or examined in greater detail.

What follows is a short account of all the species mentioned by Schlechter in 1921, as well as S. lepidus which Summerhayes described in 1960.

1. S. sulphureus Schltr. in Engl. Bot. Jahrb. 53: 485 (1915).

Type: MALAWI: Rungwe Crater Lake, Stolz 1075 (K!)

As this northern specimen has an almost smooth lip, Schlechter's key places it immediately below S. bulbinella (Rchb. f.) Bolus. Another similarity is the very short side lobes in both species. The plant is somewhat smaller than that of many specimens of S. bulbinella, the flowers larger, and the spur very short and stubby. This is the sole representative of S. sulphureus in the material presently available, and nothing can be said of its range or frequency.

2. S. bulbinella (Rchb. f.) Bolus in J. Linn. Soc. Lond. 25: 205 (1889).

Brachycorythis bulbinella Rchb. f. in Flora 50(8): 116 (1867).

Platanthera bulbinella (Rchb. f.) Schltr. in Engl. Jahrb. 20, Beibl. 50: 12 (1895).

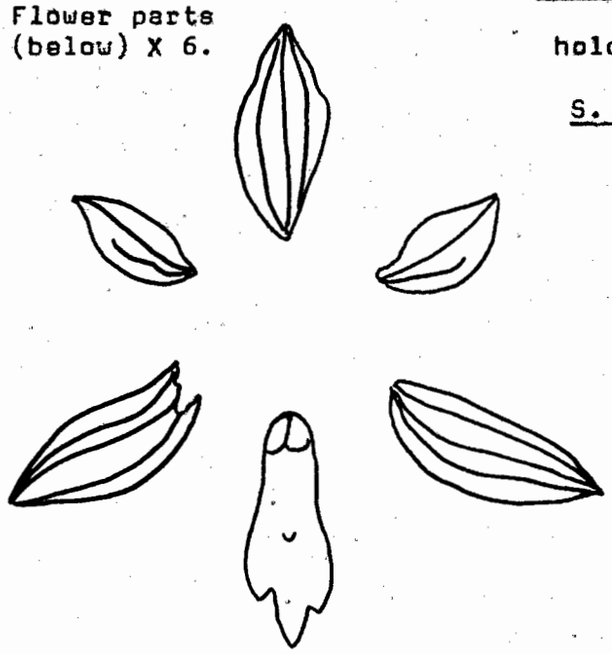
Gymnadenia bulbinella (Rchb. f.) Kränzl., in Orch. Gen. et Spec. I: 560 (1899).

Type: SOUTH AFRICA, Faku's territory, Dr. Sutherland s.n. (K!)

Rolfe placed this in his smaller-sepalled division, the plant itself being characterized by several broad basal leaves. Reichenbach describes the minute spur but does not mention colour; and Galpin 713, on which Rolfe bases the colour, was removed by Schlechter because of the presence of outgrowths on the lip. However, it seems to be generally accepted that the flowers are yellow.

This appears to be a compact group, easily recognized on dissection, which extends across the Matatiele, Kokstad and Port Shepstone grids from Lesotho to Natal. The plants collected by Rudatis at Dumisa, while plainly S. bulbinella, should be compared with the syntype of S. rudatisii Schltr. from the same area. Although the flower here is roughly twice the size of S. bulbinella, and the spur proportionally longer, the short side lobes and apparent absence of lip calli in the specimen examined (according to Schlechter's description these are present), raise the possibility of S. rudatisii's being a tall and long-spiked low-altitude variation of S. bulbinella.

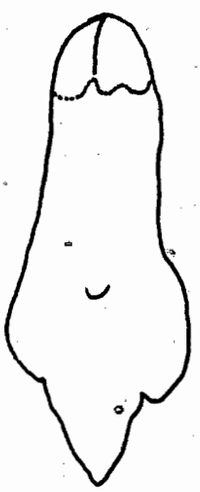
Flower parts
(below) X 6.



STOLZ 1075,

holotype of

S. sulphureus Schltr.

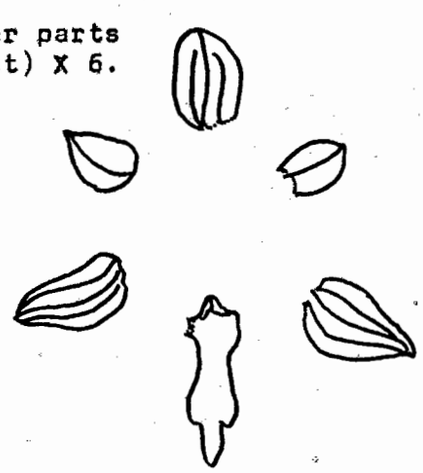


Lip
detail
X 12.

Rungwe Crater Lake
2400 m.
Flowers yellow

KEW

Flower parts
(right) X 6.



Dr. SUTHERLAND, s.n.,

holotype of

S. bulbinella (Rchb. f) Bolus.

Lip
detail
X 12.

Faku's territory,
South Africa

KEW

S. SULPHUREUS and S. BULBINELLA

An interesting fact is that "Botanic Gardens No. 13" (BOL), mounted on the same sheet as various specimens of S. bulbinella, has a lip which resembles that of S. rudatisii, and a plant form in keeping with that of S. bulbinella.

As plate (ii), a comparison of lip forms in S. bulbinella, does not indicate the exact localities in which plants were collected, the details are set out below:

LESOTHO:	Qacha's Nek, Fawkes 347 (NBG).
CAPE PROVINCE:	Drakensberg, Matatiele, McLoughlin 196 (BOL).
	Nr. Matatiele, McLoughlin 179 (BOL).
	Mt. Currie, McLoughlin 428 (BOL).
	Mt. Currie, McLoughlin 501 (BOL).
	Mt. Currie, McLoughlin s.n. (BOL. 30784).
	Mt. Currie, Tyson 1072 (BOL), quoted by Rolfe and Schlechter.
	Insiswa Mt., Schlechter 6482 (BOL), quoted by Schlechter.
NATAL:	Friedenau Farm, Dumisa, Rudatis 577 (K), quoted by Schlechter.
	Friedenau Farm, Dumisa, Rudatis 1273 (K).

3. S. rudatisii Schltr. in Beih. Bot. Centralbl. 38(2): 95 (1921).

Syntypes: NATAL: Fairfield, Alexandra County, Rudatis 159 (not seen)

Fairfield, Alexandra County, Rudatis 570 (K!)

The syntype of S. rudatisii here illustrated (iii) was collected seven years later than Schlechter's other syntype which is not available. Both are from the same area and no other specimen of S. rudatisii has been examined. Further collecting is necessary to establish whether S. rudatisii does exist as a recognizable taxon, and also to determine the extent of its occurrence.

4. S. pulchellus Schltr. in Beih. Bot. Centralbl. 38(2): 93 (1921)

Type: EAST GRIQUALAND: Insiswa Mt., Schlechter 6477 (BOL!)

This is another of the new species created by Schlechter, and is based on a specimen collected by him in January 1895, previously cited by Rolfe as an example of S. gerrardi. It is possible that Krook's specimen, Insiswa Mountains to Umzinklowa River, Krook in

MATATIELE

Fawkes 347
Flowers yellow NBG.

MATATIELE

McLoughlin 196
BOL.

MATATIELE

McLoughlin 179
BOL.

KOKSTAD

McLoughlin 428
BOL.

KOKSTAD

McLoughlin 501
BOL.

KOKSTAD

McLoughlin s.n.
Bolus 30784
BOL.

KOKSTAD

Tyson 1072
BOL.

KOKSTAD

Schlechter 6482
BOL.

PORT SHEPSTONE

Rudatis 577
K.

PORT SHEPSTONE

Rudatis 1273
K.

Tyson 1072 is cited by Rolfe as an example of S. bulbinella.

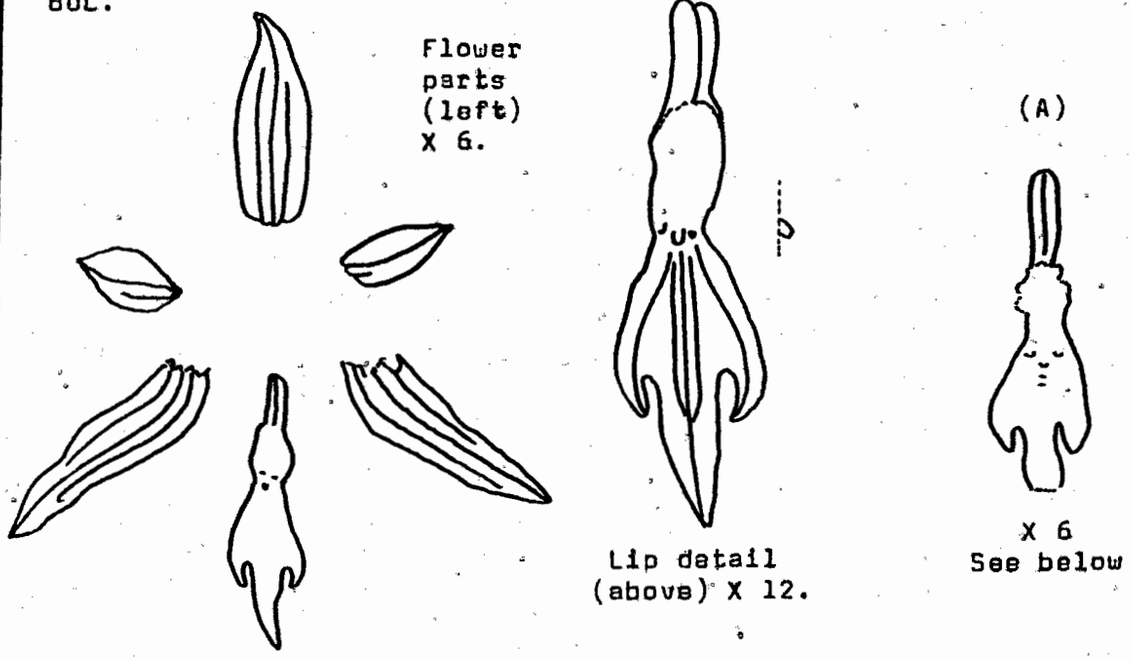
Tyson 1072, Schlechter 6484 and Rudatis 577 are cited by Schlechter as examples of S. bulbinella.

Kokstad and Matatiele specimens were found at altitudes of 1500 to over 2000 m., whereas those collected by Rudatis grew at 750 m. It is interesting to compare these with S. rudatisii, Schltr. (overleaf).

All sketches X 6.

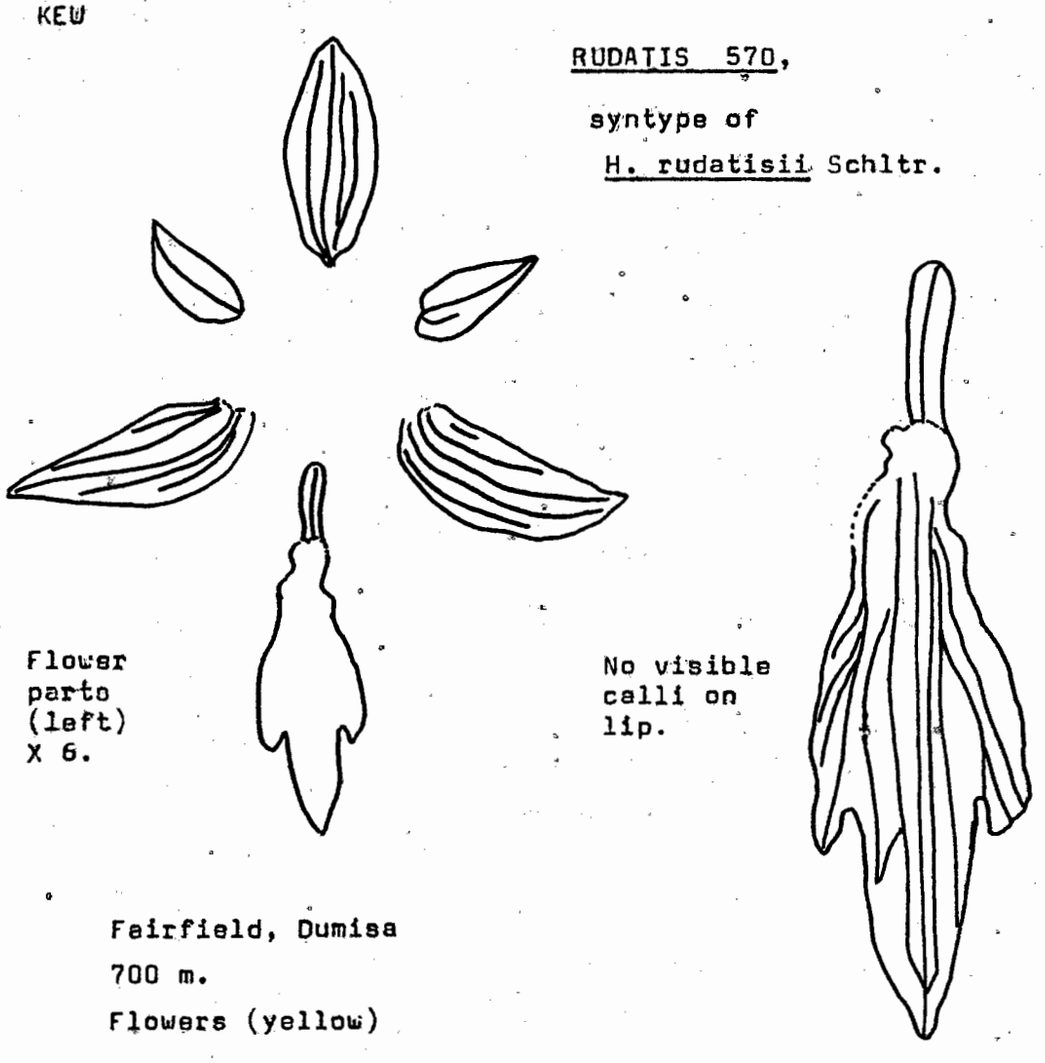
S. BULBINELLA

BOL.



SCHLECHTER 6477, holotype of S. pulchellus Schltr. Insiswa Mt., 1950 m. Flowers white. (A) above, "Botanic Gardens 13", No. 6144 in Herb. Bol., resembles S. rudatisii.

KEW



S. PULCHELLUS and S. RUDATISII

Herb. Penther 660 (not seen), may be very similar. In January 1896, Schlechter again collected specimens of S. pulchellus on Insiswa Mountain — Schlechter s.n. (K!).

In the material available, Schlechter's plants appear to be the only specimens identified as S. pulchellus. The delicate lip is quite different in outline to that of S. gerrardi, and no similar flower has been found in material so far examined.

Possibly S. pulchellus is, or was, a very local variant. Further field work might establish whether it exists as a recognizable taxon, and, if so, the range of distribution.

5. S. gerrardi (Rchb. f.) Bolus in J. Linn. Soc. Lond. 25: 205 (1889).

Brachycorythis gerrardi Rchb. f. in Flora 50(8): 116 (1867).

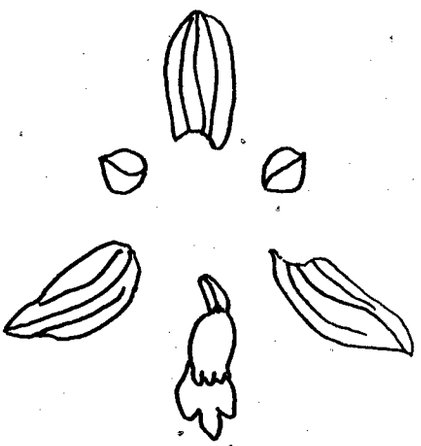
Platanthera gerrardi (Rchb. f.) Schltr. in Engl. Jahrb. 20, Beibl. 50: 12 (1895).

Gymnadenia gerrardi (Rchb. f.) Kränzl. in Orch. Gen. et Spec. I: 562 (1899).

Type: NATAL: Ingoma, Gerrard 1542 (K!)

Apparently the third Schizochilus to receive a specific name, this taxon was first collected by Gerrard at Nongoma in 1865. Neither Gerrard's specimen, nor Reichenbach's Latin description, mentions colour, although Rolfe states that the flowers are "apparently white". Four other specimens examined (all from the Louwsburg grid) are recorded as having pink overtones; three collectors observed a greenish central area at the base of the lip.

Perhaps because few specimens have been collected, and the range is restricted, the taxon shows a very characteristic lip pattern (iv) — Schlechter's "rectangular hypochil and oval epichil, with short ovoid side lobes". The spur (approximately 0,1 cm in length) constitutes ¼ to 1/5 of the overall lip length, and the flower corresponds more-or-less to Rolfe's description of the second of his smaller-sepalled species, although large plants, such as Harrison 82 (BOL) may create difficulties.



Flower parts X 6

GERRARD 1542,

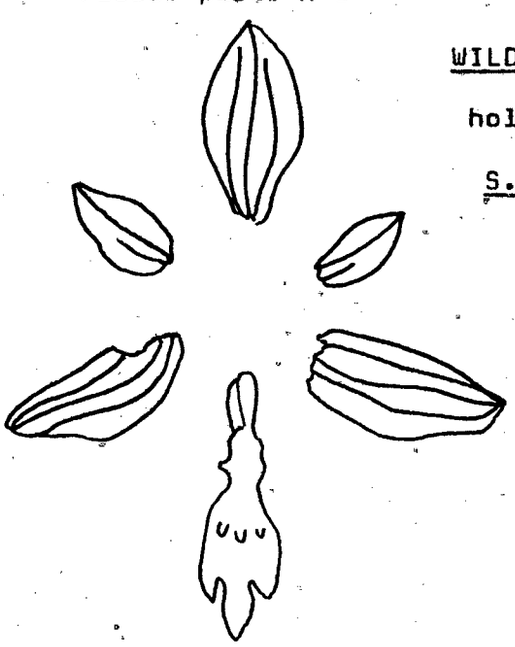
holotype of

S. gerrardi (Rchb. f.) Bolus.

Ingoma,
Natal.

KEW

Lip detail X 12



WILD 4471,

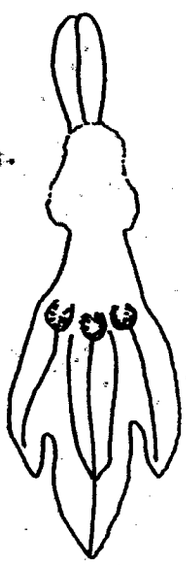
holotype of

S. lepidus, Summerhayes.

Tsitsera,
Mocambique.

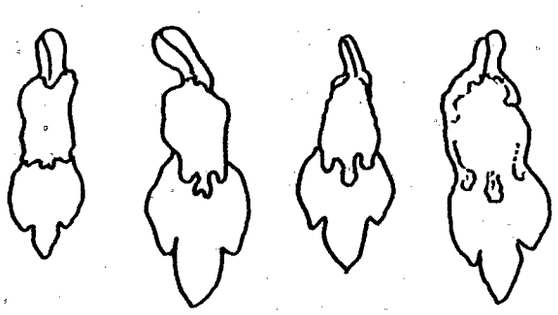
2300 m.

Flowers
yellow.

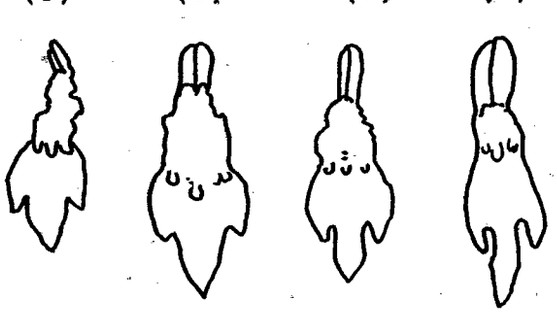


KEW

(1) (2) (3) (4)



(5) (6) (7) (8)



1. Ceza Forest, Mahlasalini, Hilliard & Burtt 3316; flowers white, sometimes pink, base of lip green. (NU)
2. Ngome, Ngotshe Dist., Harrison 82; flower segments pale lilac, greenish crests on lip. (BOL)
3. Nongoma, Acocks 13963; flowers pale pink. (PRE)
4. Ngotshe dist., Hall 819; flowers mostly white with pink nerves. (BOL)
5. Zomba Mt., McLoughlin 115. (PRE)
6. Mlanje Mt., Hilliard & Burtt 4532; flowers bright yellow. (NU)
7. Chimanimani, Hall 377 (from pickled material); flowers yellow. (BOL)
8. Nr. Amsterdam, Ermelo, v.d. Merwe 1122; flowers white with yellow lip. (PRE)

No. 8 is included as a curiosity for purposes of comparison.

S. GERRARDI and S. LEPIDUS

These Nongoma specimens of Schizochilus are very similar to the Rhodesian plants with medium-sized spur (S. lepidus Summerh.) except for colour differences — the latter species has yellow flowers — and the apparently rather minimal central keel in Rhodesian forms. While this may not be so obvious in the sketches, colourless pickled flowers from Hall 819 (on road from Nongoma, 42 miles from Vryheid) and Hall 377 (Martins Falls, Chimanimani Mts.) are much alike.

6. S. lepidus Summerh. in Kew Bull. 14: 130 (1960).

Type: MOCAMBIQUE: Tsitsera Distr., Wild 4471.

Summerhayes describes this broad-leaved species as being most closely allied to S. rudatisii, but differing from it in having longer and more densely-flowered spikes; and on the lip, three obtuse calli, almost equal in size, whereas in S. rudatisii, "the lateral ones are not so well developed as the central one which is more keel-like in shape". (These calli, if not originally missing in the flower, must have been damaged during the present dissection of S. rudatisii.) Comparisons between S. gerrardi, S. pulchellus, S. rudatisii and S. lepidus can profitably be made as more material comes to hand.

7. S. cecili Rolfe in Kew Bull. 1906: 168 (1906).

Type: RHODESIA: Inyanga, Cecil 202 (K).

S. transvaalensis Rolfe in Flora Cap. 5 (3): 92 (1912).

Syntypes: TRANSVAAL: Nr. Lydenburg, Atherstone s.n. (K!).
Mac Mac, Mudd s.n. (BOL. 5938!).
Graskop, Burtt-Davy 1464 (K!).

S. culveri Schltr. in Beih. Bot. Centralbl. 38 (2): 90 (1921).

Type: TRANSVAAL: Little Lomati River, Culver 76 (BOL!)

S. tenellus Schltr. in Beih. Bot. Centralbl. 38 (2): 92 (1921).

Type: TRANSVAAL: Nr. Lydenburg, Schlechter 3934a (?)

S. galpinii Schlechter in Beih. Bot. Centralbl. 38 (2): 92 (1921).

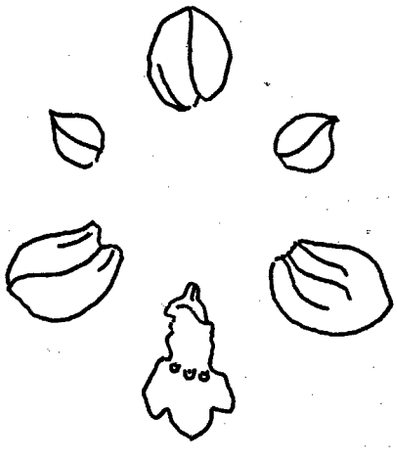
Type: SWAZILAND: Makwongwa Range near Kamhlobani, Galpin 1144 (SAM!)

Rolfe placed the small-flowered S. transvaalensis taxon (plates v, vi and vii), which is found at altitudes above 1100 metres, and often well over 2000 metres, in his smaller-sepalled group. His key states that scapes may be up to 45 cm. high, with few leaves and rather dense racemes. Flowers are noted as white, with a minute spur, scarcely 1/8 of the length of the lip, and the lip as having three fleshy tubercles at the base of the disc.

This description of the site of the tubercles resulted in a division by Schlechter of the small-flowered Transvaal specimens into those with calli on the labellum at the mouth of the spur (S. transvaalensis, which he notes he never encountered), and a group with calli almost in the middle of the lip. In this group, S. culveri was separated from S. tenellus and S. galpinii by virtue of its ligulate leaves and golden yellow flowers; in the two white-flowered species, the very short lateral lobes of the S. tenellus labellum distinguished it from S. galpinii, in which the lateral lobes were only a little shorter than the middle lobe. The validity of all these distinctions may be questioned by looking at the sketches.

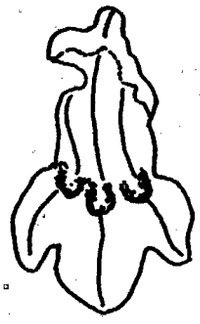
Rolfe was probably less precise in his descriptions than was Schlechter, and while lip outlines do suggest that in some flowers calli may be nearer the mouth of the spur than in others, i.e. that the portion of the lip between the mouth of the spur and the shelf-like projection of three outspread calli is sometimes short, but often rather longer, the overall pattern of this variation, considered in conjunction with variations in colour, length of spur (which often appears to be as great as 1/3 of the limb of the lip, though the size of the lip remains about the same), height of plant and number of leaves, suggest that this complex should be regarded as one species, irrespective of colour and location.

The first account of such a small-flowered Schizochilus with minute spur is Rolfe's description of S. cecili (1906), in which the plant is likened to S. bulbinella, but the flower is stated to differ in having a more markedly 3-lobed lip with 3 basal calli. This description would cover the entire S. transvaalensis group, with the reservation that certain measurements given, while proportionally



Flower parts X 6

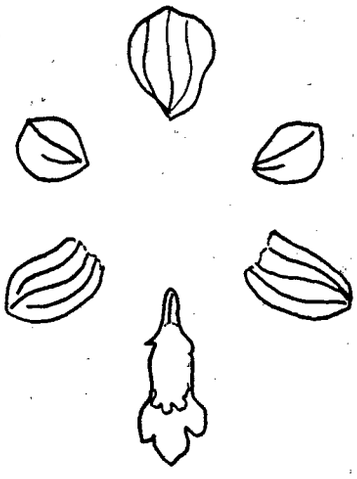
NORLINDH & WEIMARCK 4973,
identified at Kew as
an example of
S. cecili Rolfe.



Lip detail X 12

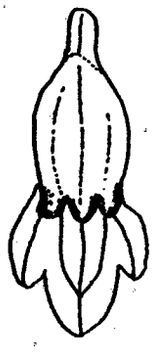
Inyangani Mt.
2450 m.
Flowers cream

KEW



Flower parts X 6

CULVER 76,
holotype of
S. culveri Schlechter.



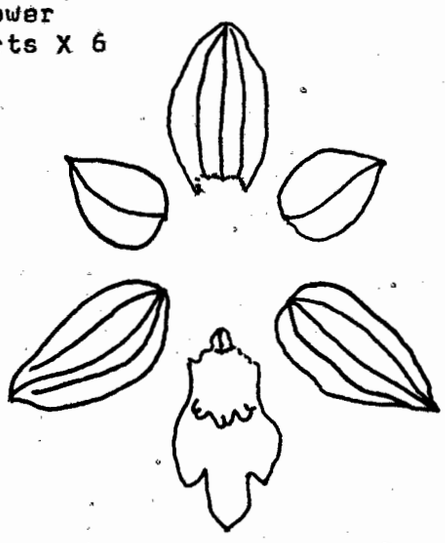
Lip detail X 12

Little Lomati River
1070 m.
Flowers yellow

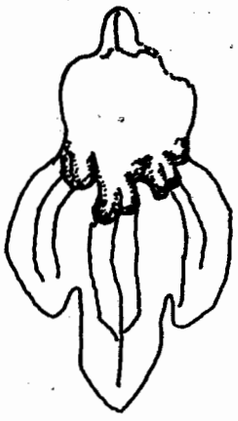
BOL.

S. CECILI and S. CULVERI

Flower parts X 6



BURTT-DAVY 1464,
syntype of
S. transvaalensis, Rolfe.

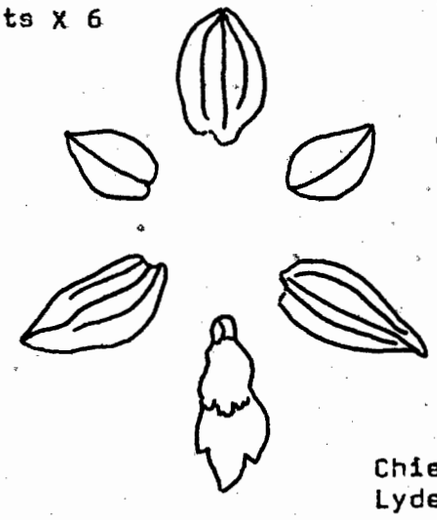


Stubby split keel: lip detail X 12

Graskop

KEW

Flower parts X 6



ATHERSTONE s.n. (K),
syntype of
S. transvaalensis Rolfe.

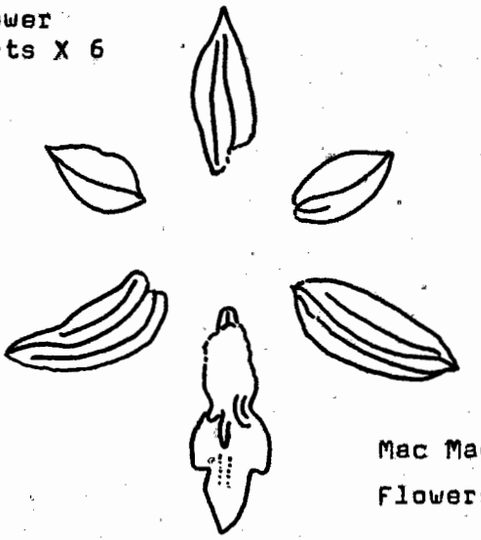
Lip detail X 12

Chiefly near Lydenburg

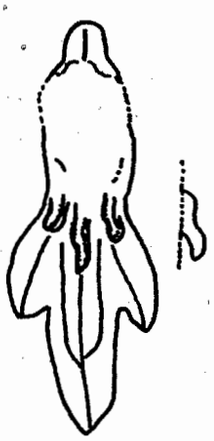
Flowers (white)

KEW

Flower parts X 6



MUDD s.n., Bol. 5938,
syntype of
S. transvaalensis Rolfe.



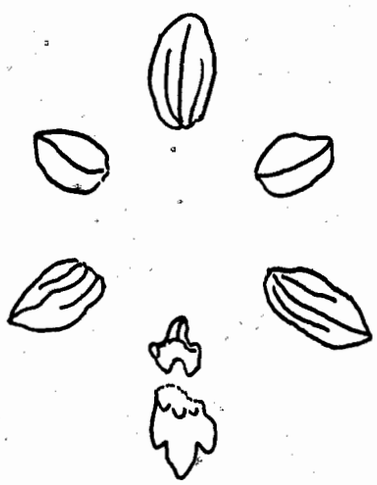
Lip detail X 12

Mac Mac

Flowers white

BOL.

SYNTYPES OF S. TRANSVAALENSIS



Flower parts X 6

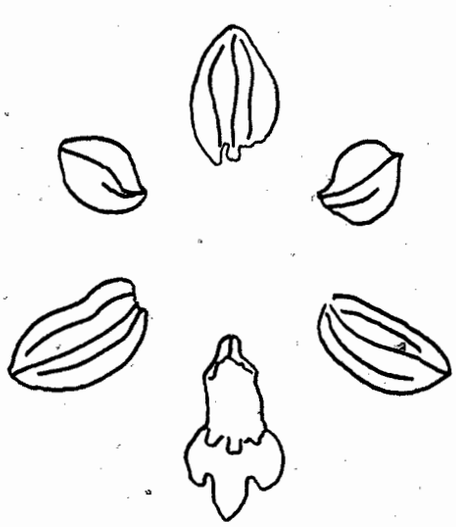
WILMS 1385,
considered by Schlechter
to belong to
S. tenellus Schlechter.

Devil's Knockels,
Lydenburg

Flowers (white, lip golden yellow)

KEW

Lip detail X 12



Flower parts X 6

GALPIN 1144,
holotype of
S. galpinii Schlechter.

Makwongwa Range near
Kamhlobani

1100 m.

Flowers white

S.A. MUS.

Lip detail X 12

S. TENELLUS and S. GALPINII

applicable, are frequently somewhat greater.

It is suggested that all minutely spurred specimens of Schizochilus with basal calli should be known under the earliest specific name of S. cecili Rolfe.

As plates (viii) and (ix) do not indicate the exact localities from which plants were collected, the details are set out below:

MALAWI: Chilemba Peak, Mlanje Mt., Chapman 503 (BOL).

RHODESIA: Inyangani Mt., Inyanga, Norlindh & Weimarck 4973 (K).
Inyanga Fort, Fisher 1451 (PRE).

TRANSVAAL: Wolkberg, Mogg s.n. (PRE 31702).
Mauchsberg, Sabie, Smuts & Gillett 2338 (PRE).
Graskop, Burtt-Davy 1464 (K).
Graskop Peak, Galpin s.n. (BOL 30786).
Graskop Peak, Galpin 14438 (K).
Pilgrim's Rest, Hall 631 (BOL).
MacMac, Mudd s.n. (BOL 5938).
Graskop, Atherstone s.n. (K).
Kemp's Heights, Marais 318 (PRE).
Mt. Anderson, Meeuse 10062 (PRE).
Devil's Knockels, Lydenburg, Wilms 1385 (K).
Banks of Little Lomati, Culver 76 (BOL).
Bosch's nr. Barberton, Galpin 713 (BOL).

SWAZILAND: Makwongwa Range, nr. Kamhlobani, Galpin 1144 (SAM).
5 miles W. of Pigg's Peak P.O., Codd 8174 (PRE).
Nduma, Mbabane, Compton 25384 (K).
Between Dalriach & Forbes Reef, Bolus 12320 (BOL).

8. S. albiflos Schltr. in Beih. Bot. Centralbl. 38(2): 91 (1921)

The type of this, given as Van Reenen 1500-1800 m., Wood s.n., has not been located; Wood 3444 (BOL), removed by Schlechter from S. angustifolius Rolfe, is presented in its place. Other specimens which Rolfe included in the concept S. angustifolius, but which (Schlechter felt) were not matched by the description, viz. Sankey 256 and Allison 6, are also best regarded as S. albiflos.

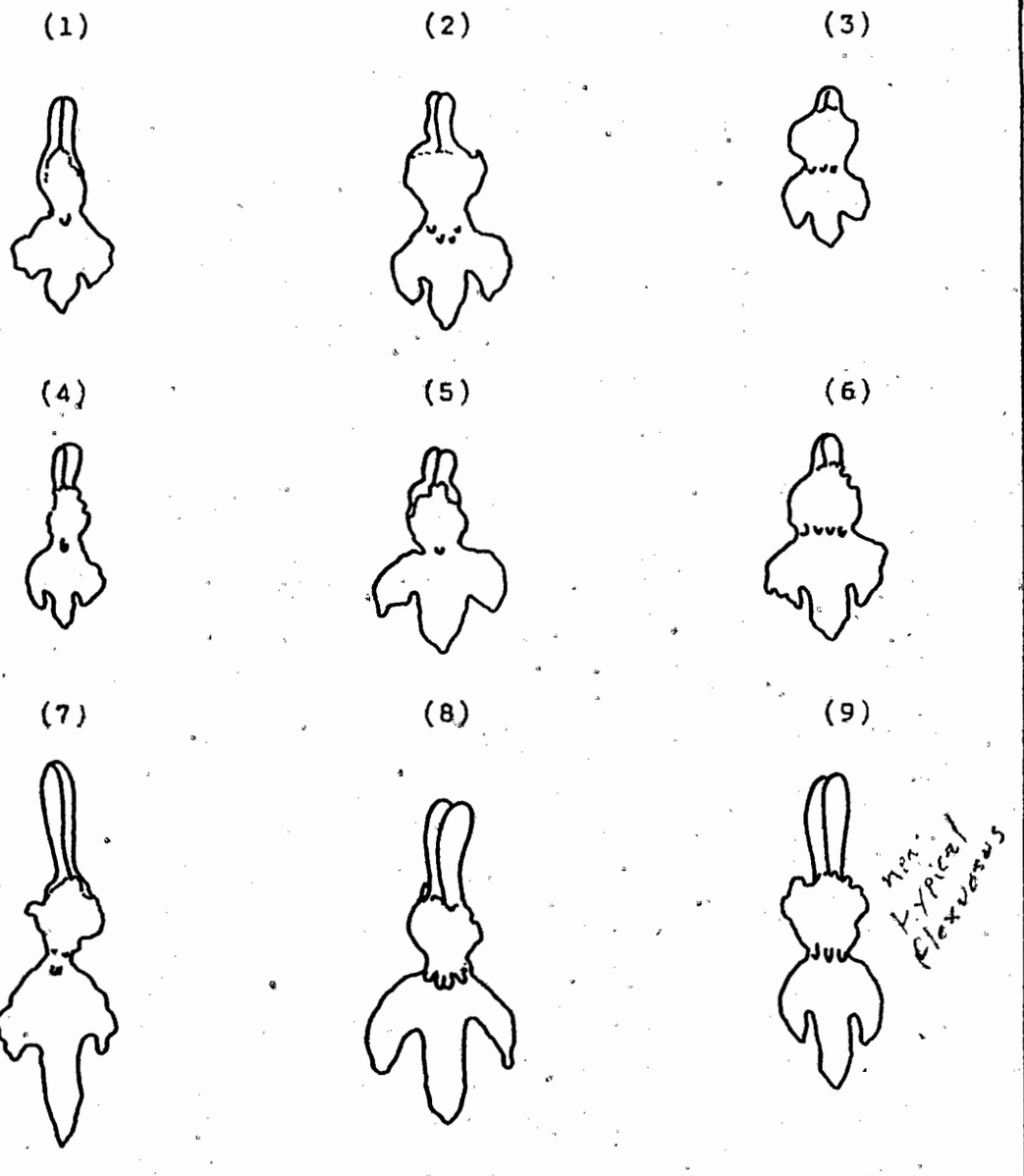
Plants of this taxon are very low growing (7-15 cm), with small compact spikes and white flowers, or white with a yellow lip. Schlechter describes the lip as obviously constricted in the middle with a broad epichil, and the spur is roughly ¼ of the length of the limb of the lip. Typical specimens have been collected at Harrismith,

ZOMBA  Chapman 503 Flowers yellow. BOL.	INYANGA  Norlindh & Weimarck 4973 Flowers cream. K.	INYANGA  Fisher 1451 Flowers yellow, occ. albinos. PRE.
TZANEEN  Mogg s.n. PRE. 31702 PRE.	PILGRIM'S REST  Smuts & Gillett 2338 Flowers white PRE.	PILGRIM'S REST  Burtt-Davy 1464 K.
PILGRIM'S REST  Galpin s.n. BOL. 30786 Flowers pure white BOL.	PILGRIM'S REST  Galpin 14438 Flowers white K.	PILGRIM'S REST  Hall 631 Flowers white BOL.
PILGRIM'S REST  Mudd s.n. BOL. 5938 Flowers white BOL.	Norlindh and Weimarck 4973 is identified by Kew as S. cecilii Rolfe. Burtt-Davy 1464 is a syntype of S. transvaalensis Rolfe. Mudd s.n. is a syntype of S. transvaalensis Rolfe. All sketches X 6.	

LIP PATTERNS IN THE S. CECILI COMPLEX I.

LYDENBURG  Atherstone s.n. K.	LYDENBURG  Marais 318 Flowers bright yellow PRE.	LYDENBURG  Moeuse 10062 Flowers white PRE.
LYDENBURG  Wilms 1385 K.	KOMATIPOORT  Culver 76 Flowers yellow BOL.	KOMATIPOORT  Galpin 713 Flowers bright golden-yellow BOL.
KOMATIPOORT  Galpin 1144 Flowers white SAM.	KOMATIPOORT  Codd 8174 Flowers clear yellow PRE.	CAROLINA  Compton 25384 Flowers bright yellow K.
MBABANE  Bolus 12320 BOL.	Atherstone s.n. is a syntype of *S. transvaalensis* Rolfe. Wilms 1385, cited by Rolfe as an example of *S. gerrardi* (Rchb. f.) Bolus, is considered by Schlechter to belong to *S. tenellus* Schlechter. Culver 76, Galpin 713 and Bolus 12320 are syntypes of *S. culveri* Schlechter. Galpin 1144 is the holotype of *S. galpinii* Schlechter. All sketches X 6.	

LIP PATTERNS IN THE S. CECILI COMPLEX II.



1. Allison 6, a syntype of S. angustifolius Rolfe, more correctly placed in S.albiflos Schltr; flowers white with yellow lip. Olivier's Hoek. (K)
2. Wood 10,763; flowers white. Van Reenen. (PRE)
3. Nr. Tugela Falls, Wood 3444, syntype of S. albiflos Schltr; flowers (white) (BOL)
4. Cathedral Path, Cathedral Peak area, Schelpe 136; flowers white with yellow lip. (NU)
5. Camel Head, Cathedral Peak, Bursell s.n., NU 7330; flowers white & yellow. (NU)
6. Camel, Cathedral Peak, Schelpe 7199; sepals and petals white, lip bright yellow. (BOL)
7. Cathkin Park, Galpin 11727; flowers white with bright yellow lip. (PRE)
8. Giants Castle, Trauseld 367; flowers white. (NU)
9. Giants Castle, Bruyns-Haylett 37; flowers white. (NU)
10. Above Karkloof, Sanderson 1080. (K)
11. Marwaga Mt., Bulwer, Marais 1454; flowers white with yellow. (KEW)

All sketches X 6.

S. ALBIFLOS and S. FLEXUOSUS

Van Reenen, Tugela Falls and Cathedral Peak.

It is tempting to consider whether S. albiflos does not grade into the white-flowered S. flexuosus Rolfe ex Harv. (collected at Liddesdale), with longer spur but very similar lip, and even into the yellow-flowered S. woodii Schltr. (collected at Van Reenen). As more material is examined, more intermediate forms will probably appear. It is of interest to note that No. 10 (Sanderson 1080) in plate xi is listed by Rolfe as an example of S. zeyheri, while Sankey 256 (plate x) is given as a syntype of his new species, S. angustifolius.

9. S. angustifolius Rolfe in Flora Cap. 5 (3): 93 (1912).

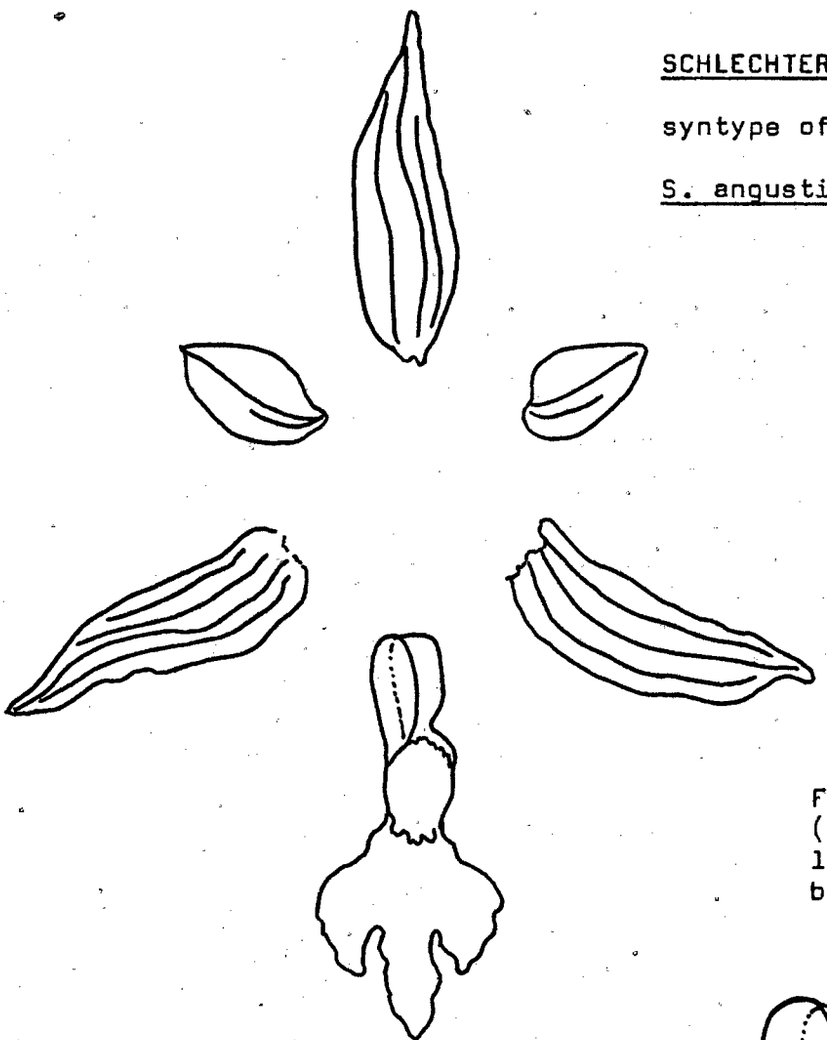
Type (as restricted by Schlechter): CAPE PROVINCE: Insiswa Mt., Schlechter 6484 (BOL!)

Rolfe placed this species with the smaller-sepalled, low growing taxa, where it is certainly quite distinct from S. bulbinella and S. gerrardi, but in height of plant and size of sepal very similar to Zeyher 56. The most noticeable differences are the shorter central keel and spur (which in the flower here dissected is one-third, not one-quarter, as long as the limb of the lip). Schlechter does not mention the spur length and regards the specimen as being closely allied to S. zeyheri, but differing from it in having ovate petals and broader side lobes to the lip. Throughout the larger-flowered Schizochilus complex there is considerable variation in development of tubercles, shape of petals, and length of spur; and this is probably one of many species which should eventually be reincorporated in S. zeyheri (see plate xii).

10. S. trilobus Rolfe in Flora Cap. 5 (3): 91 (1921).

Type: NATAL: Dargle Farm, Mrs. Fannin 8 (?)

It seems likely that this species is based upon only one collecting, of which specimens have not come to hand. Rolfe describes the lip as shortly tri-lobed, and the spur as about half the length of the limb of the lip. As the flowers are from the same locality as one of the two syntypes of S. flexuosus, they may well be variants within the "S. sandersoni" complex.

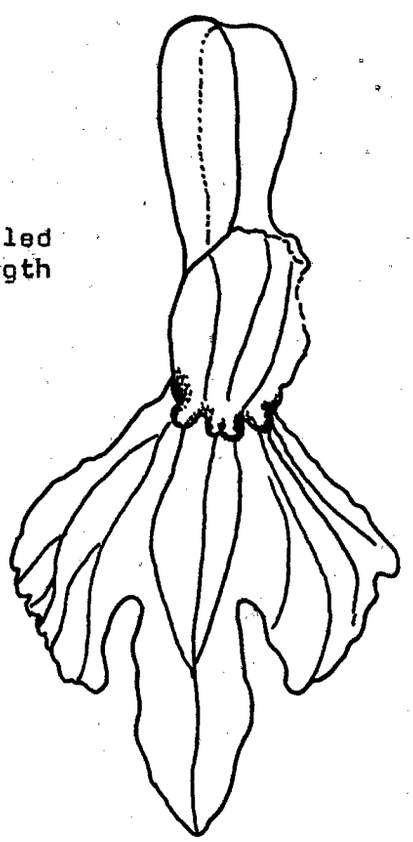


SCHLECHTER 6484,

syntype of

S. angustifolius Rolfe.

Flower parts (left) X 6; lip detail below X 12.



Regarded by Rolfe as a smaller-sepalled taxon, with spur one-quarter the length of the limb of the lip.

The other three syntypes, of which Schlechter saw only Wood 3444, undoubtedly belong to S. albiflos Schltr.

Schlechter considers the revised species to be closely allied to S. zeyheri, distinguished by broader petals and larger side lobes to the lip.

Insiswa Mt.

2075 m.

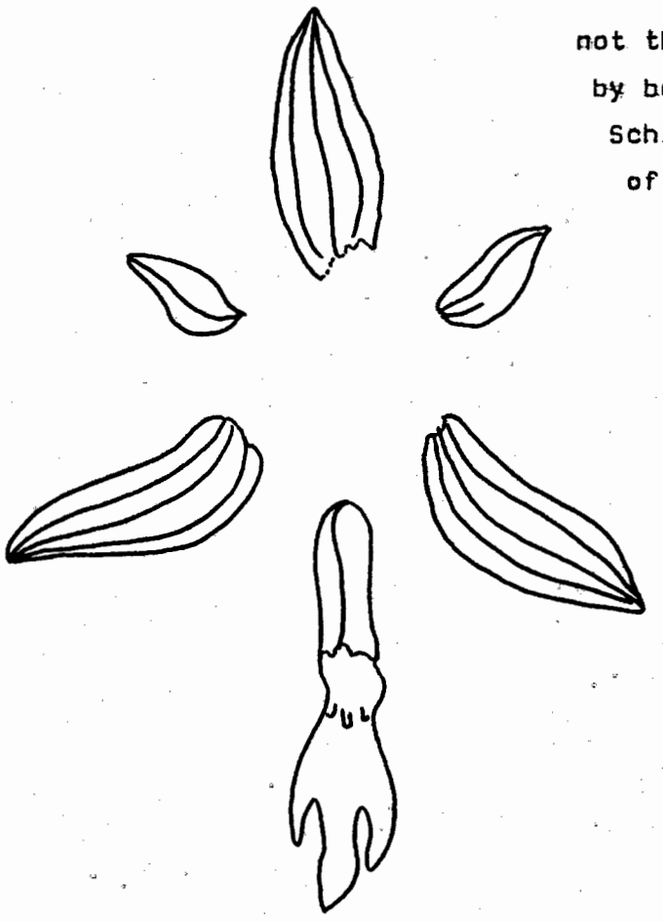
Flowers white.

BOL.

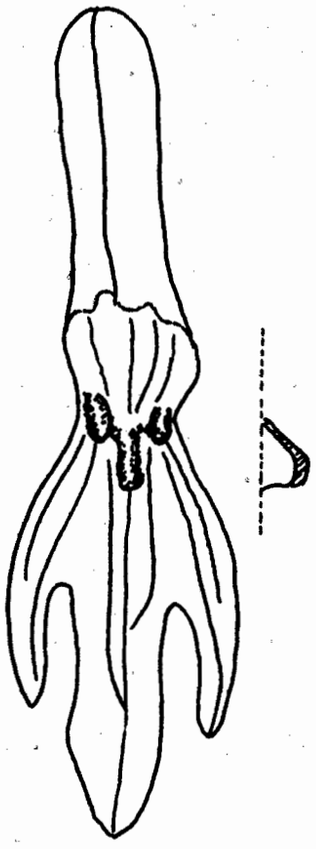
KOKSTAD

ZEYHER 56,

not the type, but quoted by both Rolfe and Schlechter as an example of S. zeyheri Sond.



Flower parts (left) X 6; lip detail below X 12.



Katberg
1200-1500 m.

MELBOURNE

FORT BEAUFORT

11. S. zeyheri Sond. in Linnaea 19: 78 (1847).

Brachycorythis zeyheri (Sond.) Rchb. f. in Flora 50 (8): 117 (1867)

Platanthera zeyheri (Sond.) Schltr. in Engl. Jahrb. 20, Beibl. 50: 12 (1895).

Gymnadenia zeyheri (Sond.) Kränzl. in Orch. Gen. et Spec. I: 561 (1899).

Type: CAPE PROVINCE: Winterberg Mts., Zeyher s.n. (?)

S. baurii Schltr. in Beih. Bot. Centralbl. 38 (2): 98 (1921).

Type: CAPE PROVINCE: Baziya Mt., Baur 630 (K!).

S. caffrus Schltr. in Beih. Bot. Centralbl. 38 (2): 94 (1921).

Type: CAPE PROVINCE: Baziya Mt., Baur 631 (K!).

S. grandiflorus Schltr. in Beih. Bot. Centralbl. 38 (2): 100 (1921).

Type: CAPE PROVINCE: Dokin, Pondoland, Bachmann 416 (?)

S. grandiflorus var. crenulata Schltr. in Beih. Bot. Centralbl. 38 (2): 101 (1921).

Type: CAPE PROVINCE: Umkwani, Pondoland, Tyson 2605 (PRE!).

(Syntypes rather) Westgate, Port St. Johns, Galpin 3416 (BOL!)

S. strictus Rolfe in Flora Cap. 5 (3): 91 (1912).

Syntypes: TRANSVAAL: Klein Olifant's River, Schlechter 4028 (K!)

Lydenburg dist., Wilms 1397 (?)

S. clavatus Schltr. in Beih. Bot. Centralbl. 38 (2): 96 (1921).

Syntypes: TRANSVAAL: Elandspruit Mts., Schlechter 3989. (?)

Belfast, Doidge 551 (K!). (It is presumed that this is in fact No. 4799 in Transv. Dept. Agr. Colon. Herb., received from Kew.)

S. bolusii Schltr. in Beih. Bot. Centralbl. 38 (2): 95 (1921).

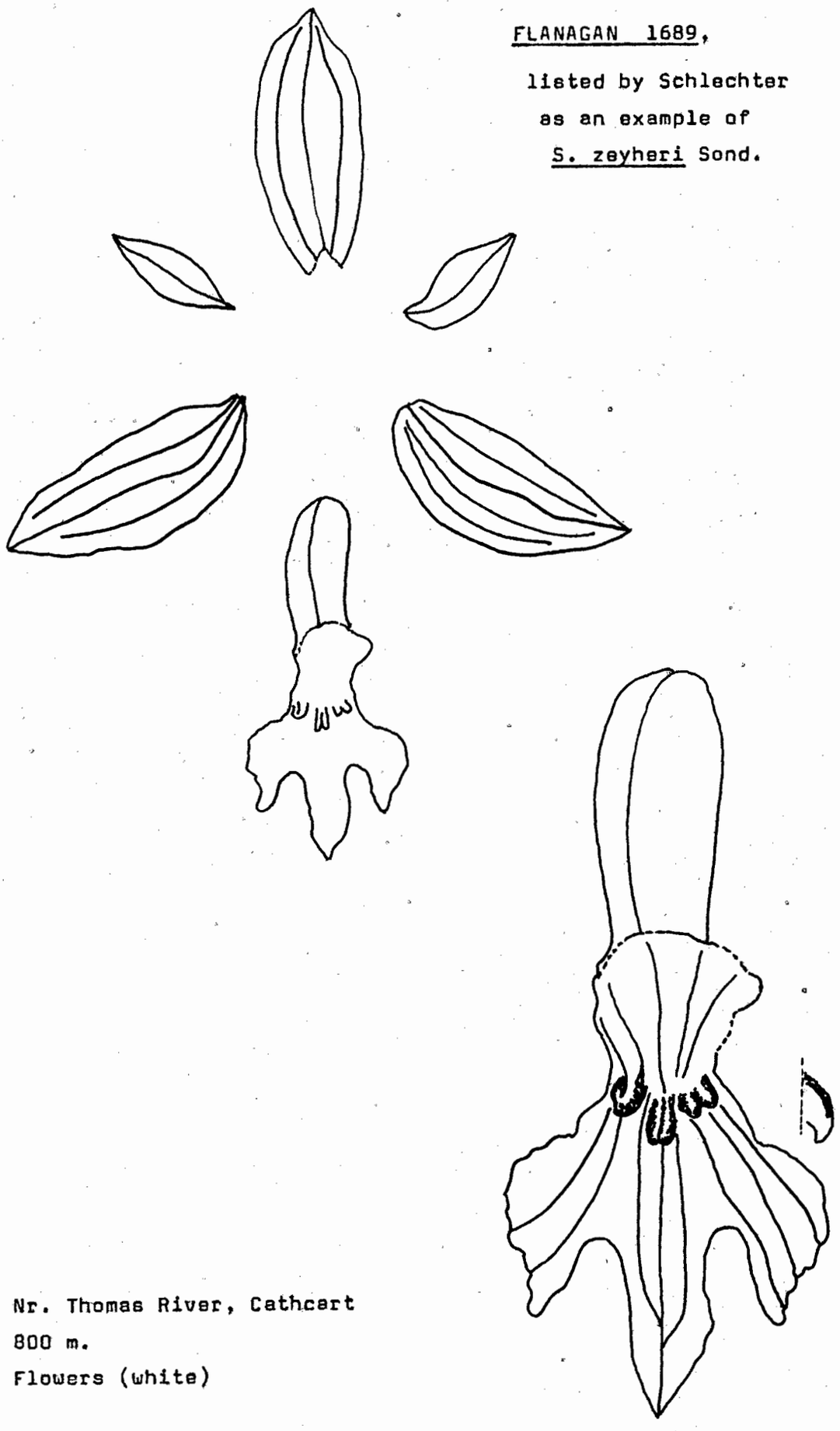
Type: SWAZILAND: Between Mbabane and Oshoek, Bolus 12321 (BOL!).

S. rehmanni Rolfe in Flora Cap. 5 (3): 92 (1912).

Syntypes: TRANSVAAL: Houtbosch, Rehmann 5849 (K!)

Nr. Lydenburg, Atherstone s.n. (?) - possibly this is Atherstone 22070 (NBG!)

Mac Mac, Mudd s.n. (?).



FLANAGAN 1689,

listed by Schlechter

as an example of

S. zeyheri Sond.

Nr. Thomas River, Cathcart

800 m.

Flowers (white)

S.A. MUS.

STUTTERHEIM

S. huttonae Schltr. in Beih. Bot. Centralbl. 38 (2): 99 (1921).

Type: TRANSVAAL: Johannesburg, Mrs. Hutton 275 (PRE!).

S. sandersoni Harv. ex Rolfe in Flora Cap. 5 (3): 91 (1912).

Syntypes: NATAL: Field's Hill, Sanderson 564 (?).
Nr. Durban, Gerrard 2176 (?).
Inanda, Wood 478 (K!).

S. woodii Schltr. in Beih. Bot. Centralbl. 38 (2): 99 (1921).

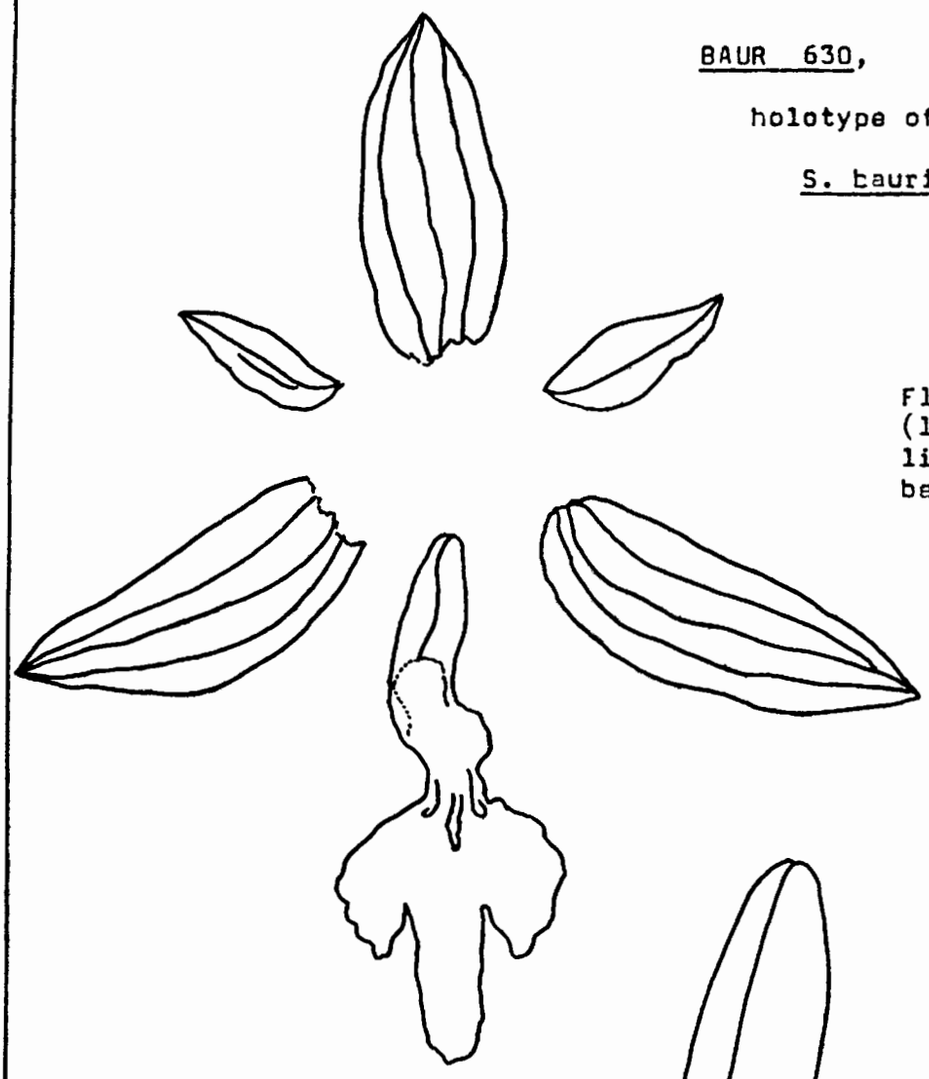
Type: NATAL: Van Reenen, Wood 9307 (?).

S. flexuosus Harv. ex Rolfe in Flora Cap. 5 (3): 92 (1912).

Syntypes: NATAL: Mrs. Fannin 56 (?).
Liddesdale, Wood 3934 (BOL!).

Zeyher 56 (plate xiii) and Flanagan 1689 (plate xiv) are among the few specimens accepted by Schlechter as typical of S. zeyheri. Of the new species which Schlechter announced in 1921, S. baurii (Baur 630) and S. caffrus (Baur 631) are the two most obvious candidates for re-transfer to S. zeyheri. These yellow-flowered specimens, gathered consecutively on Baziya mountain at an altitude of 1220 metres, are both listed by Rolfe under S. zeyheri (see plates xv and xvi). Schlechter considered the petals to be broader than in S. zeyheri (this is not so in the dissections now presented); and regarded the long spur and yellow lip with reddish-brown papillae as distinctive, separating Baur 630 as S. baurii, on that account, from its companion. Of Baur 631 (S. caffrus), Schlechter says that the spur is about one-third the length of the limb of the lip, the lateral lobes barely half the length of the intermediate lobe, and the flowers smaller with broader petals than in S. zeyheri. None of these distinctions is apparent on comparison with Zeyher 56, suggesting much variation in the same population, and possibly even in the same spike, with regard to colour, length of spur, and size and form of lip and perianth segments.

Of S. grandiflorus Schltr. (see plate xxv, Nos. 8, 9, and possibly 11), one feels that it should be noted that these yellow-

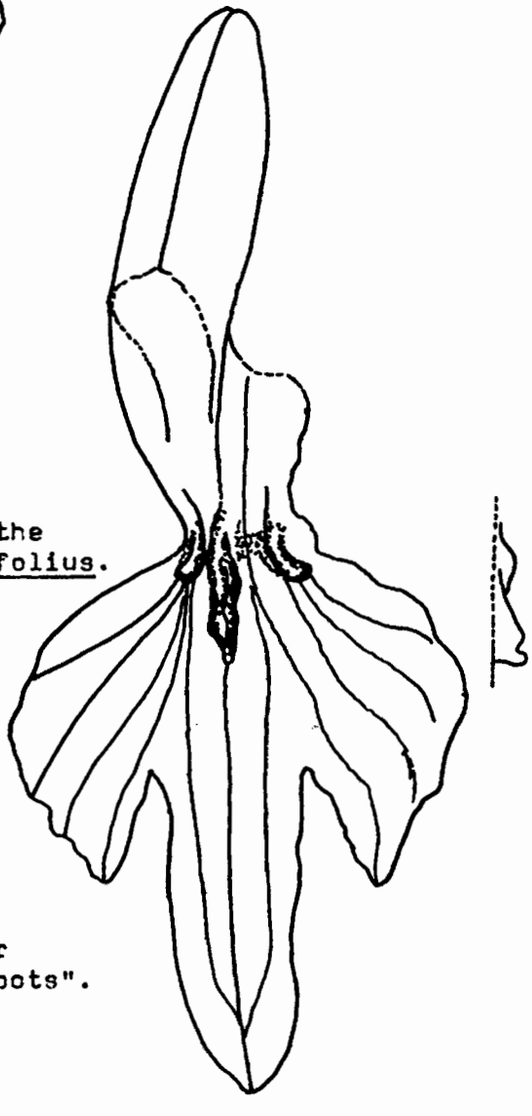


BAUR 630,

holotype of

S. baurii Schltr.

Flower parts (left) X 6; lip detail below X 12.



Cited by Rolfe as an example of S. zeyheri Sond.

Schlechter thought the petals too broad for S. zeyheri and the plant too high for S. angustifolius.

Of Baur 631 from the same mountain, Schlechter created a further new species.

Baziya Mt.

1220 m.

Flower "porcelain white; lower lip dark yellow with darker spots".

KEW

flowered forms of Schizochilus tend to occur at lower altitudes along the Pondoland coast and northwards to Port Shepstone. Equally long-spurred specimens have been collected in the Transvaal and Natal, although the petals of these are often shorter and broader in outline.

The concepts S. strictus Rolfe (xvii), S. clavatus Schltr. (xviii), S. bolusii Schltr. (xix) and S. rehmanni Rolfe (xx) probably apply equally well to any member of the same yellow-flowered Transvaal taxon which, it is suspected, will ultimately be referred to as S. zeyheri.

Both Rolfe and Schlechter mention the long spur in S. rehmanni; Rolfe placed this in his smaller-sepalled group, and in this set of dissections, the sepals are slightly smaller than those of Zeyher 56 and of the Belfast specimen collected by Doidge, and presumed to be S. clavatus. However, the likelihood of consistent findings is open to question.

S. huttonae (with very ovate petals) seems to represent the final development of long-spurred flowers in the Transvaal. Schlechter records that this (xxi) is similar to S. sandersoni (xxii) with respect to petal shape, but differs from it in having shorter side lobes to the lip. These distinctions are not apparent in the present sketches. Nor, in these sketches, is Wood 9173 (xxiii) — if correctly selected as comparable to Wood 9307 — so very different to S. sandersoni or even to S. huttonae.

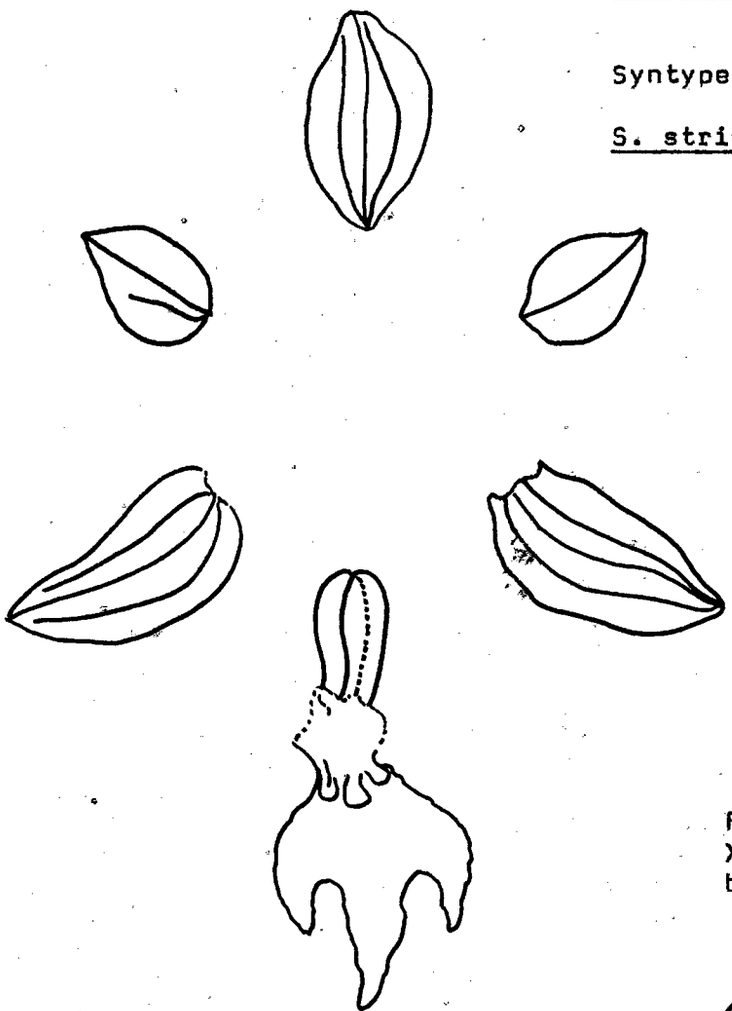
Wood 3934, syntype of S. flexuosus (xxiv) appears to have rather distinctive short side lobes to the lip. Rolfe (or Harvey) stressed the dense, recurved spikes, and Schlechter felt that both the character of the spikes and the short side lobes distinguished this species from S. rehmanni. The matter of the spikes has not been investigated, but this too may turn out not to be a consistent feature.

This brief survey suggests that long-spurred flowers may arise anywhere — possibly this is influenced by the moisture available — and these too may come to be regarded as variants of S. zeyheri. See plates xxv, a comparison of lip forms from the Cape Province, and xxvi, a comparison of lip forms from Natal and the Transvaal.

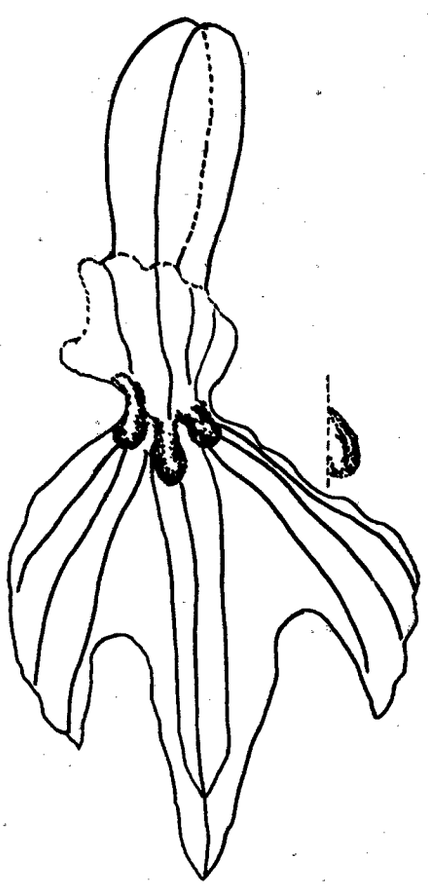
SCHLECHTER 4028,

Syntype of

S. strictus Rolfe.



Flower parts (left) X 6; lip detail below X 12.



Stated by Rolfe to have narrower leaves than S. zeyheri and S. sandersoni; said by Schlechter to resemble S. clavatus Schltr., differing from this in more robust habit, and shorter side lobes of lip.

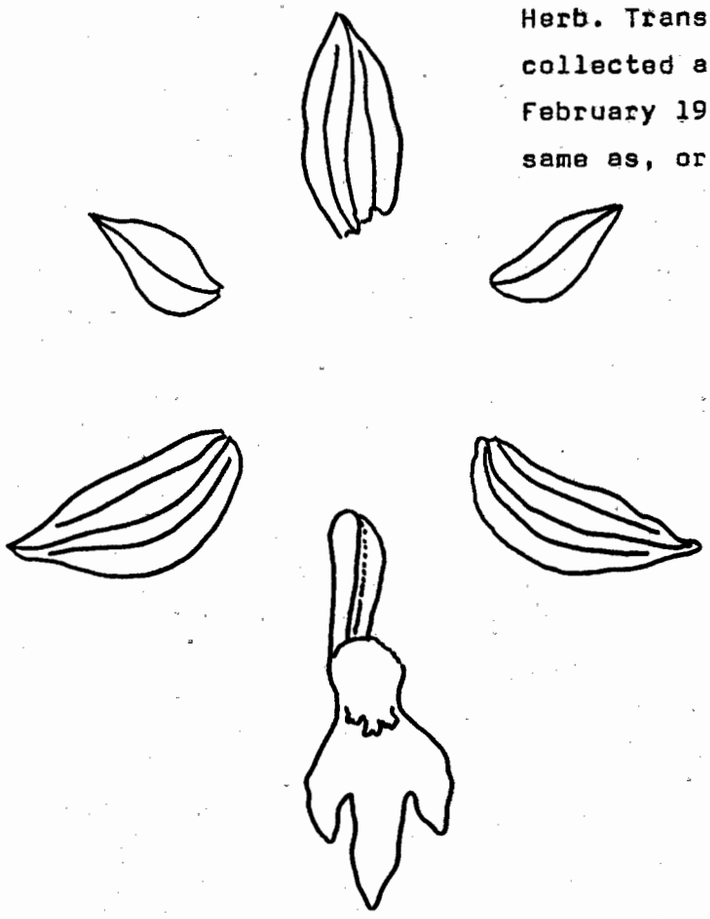
Klein Olifant's River

1600 m.

Flowers (apparently yellow)

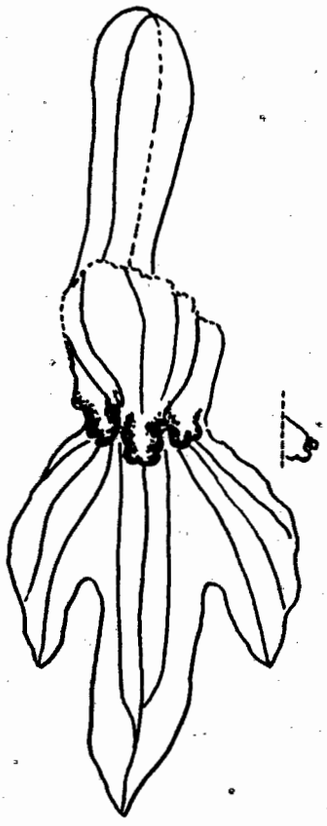
KEW

WITBANK



DOIDGE s.n., No. 4799 in Herb. Transv. Dept. Agr. (K), collected at Belfast in February 1909; possibly the same as, or similar to, Doidge 551, syntype of S. clavatus, Schltr.

Flower parts (left) X 6; lip detail (below) X 12.

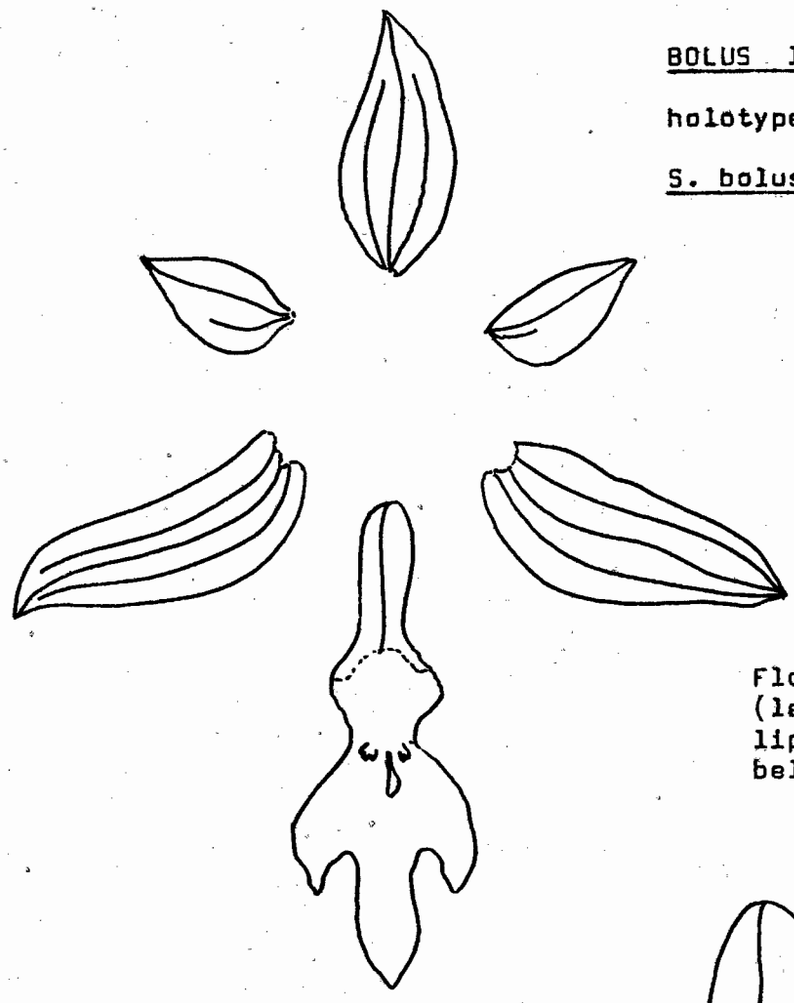


Schlechter states that this species has longer side lobes to the lip, and a less robust habit, than S. strictus Rolfe.

Belfast

Flowers (yellow)

KEW



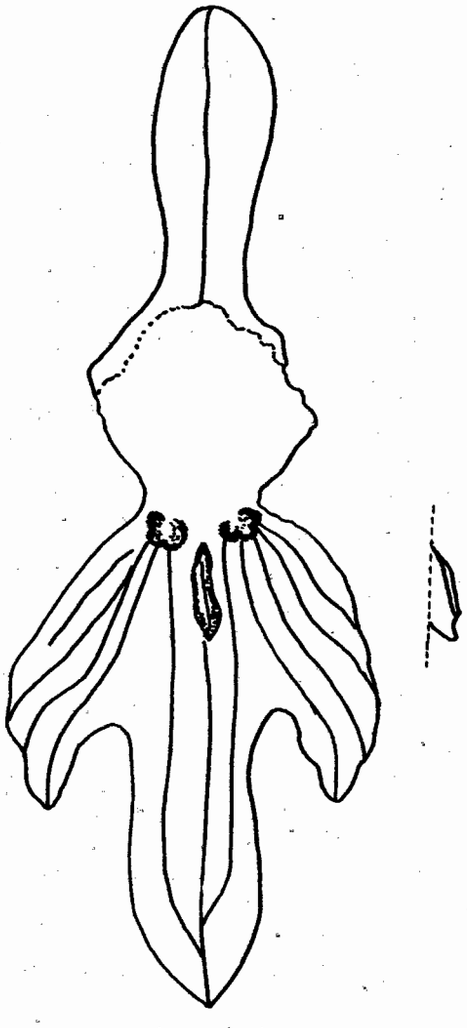
BOLUS 12321,

holotype of

S. bolusii Schltr.

Flower parts (left) X 6; lip detail below x 12.

Regarded by Schlechter as being most closely allied to S. rudatisii Schltr., but with narrower petals and longer side lobes to lip.



Between Mbabane and Oshoek

1600 m.

Flowers (yellow)

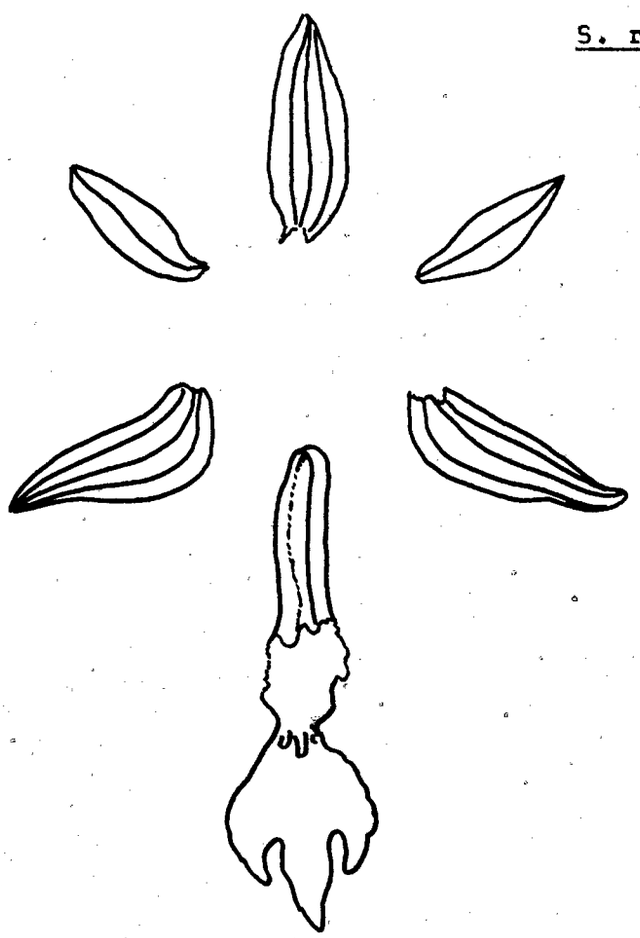
BOL.

MBABANE

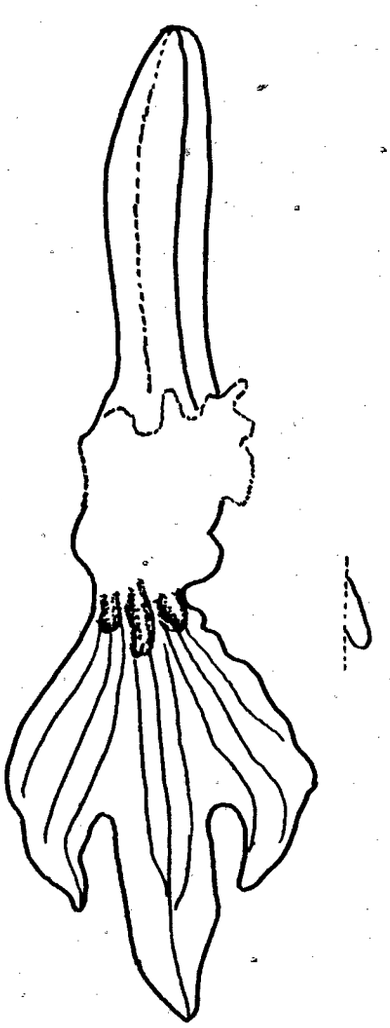
REHMANN 5849,

syntype of

S. rehmanni Rolfe.



Flower parts (left) X 6; lip detail (below) X 12.



Rolfe places this in his smaller-sepalled group, noting that the spur is rather longer than the limb of the lip. Schlechter stresses the lanceolate petals and long spur, and regards the side lobes of the lip as being longer than in S. woodii Schltr.

Houtbosch, Transvaal.

Flowers (orange in Mudd's specimen)

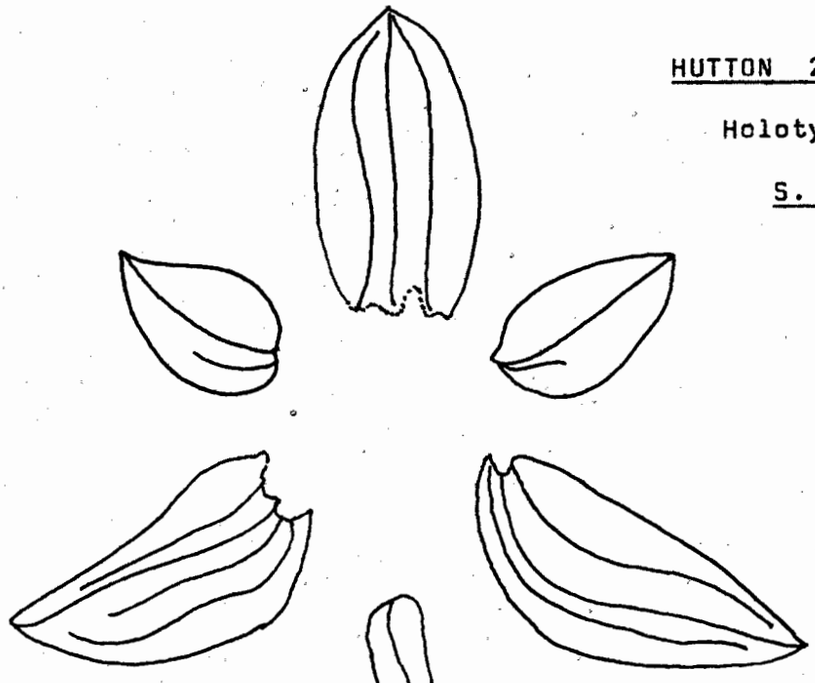
KEW

PIETERSBURG

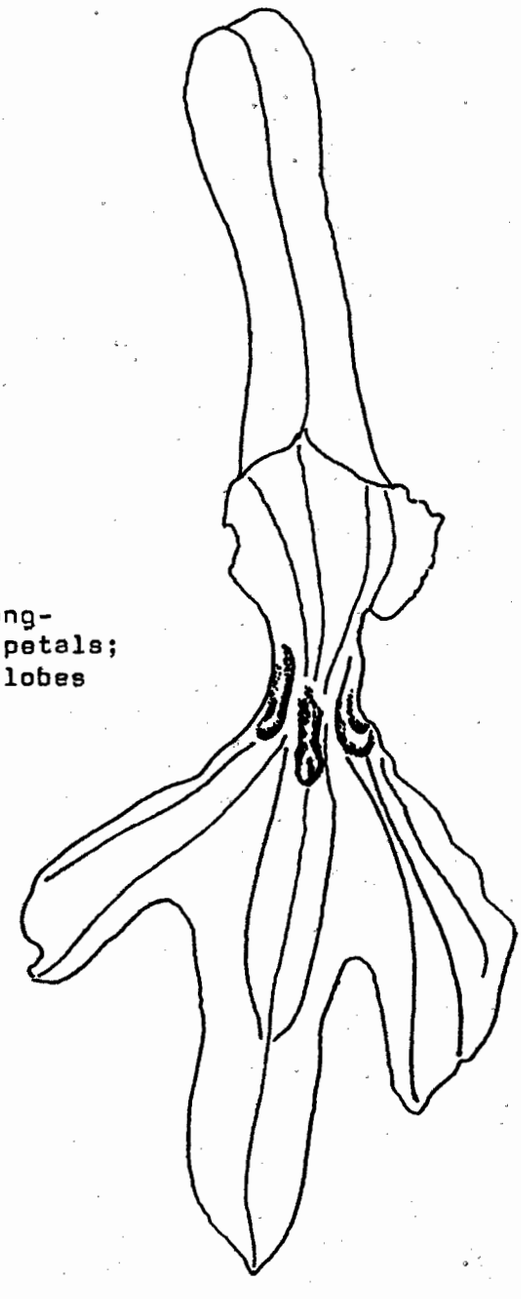
HUTTON 275,

Holotype of

S. huttonae Schltr.



Flower parts (left) X 6; lip detail below X 12.



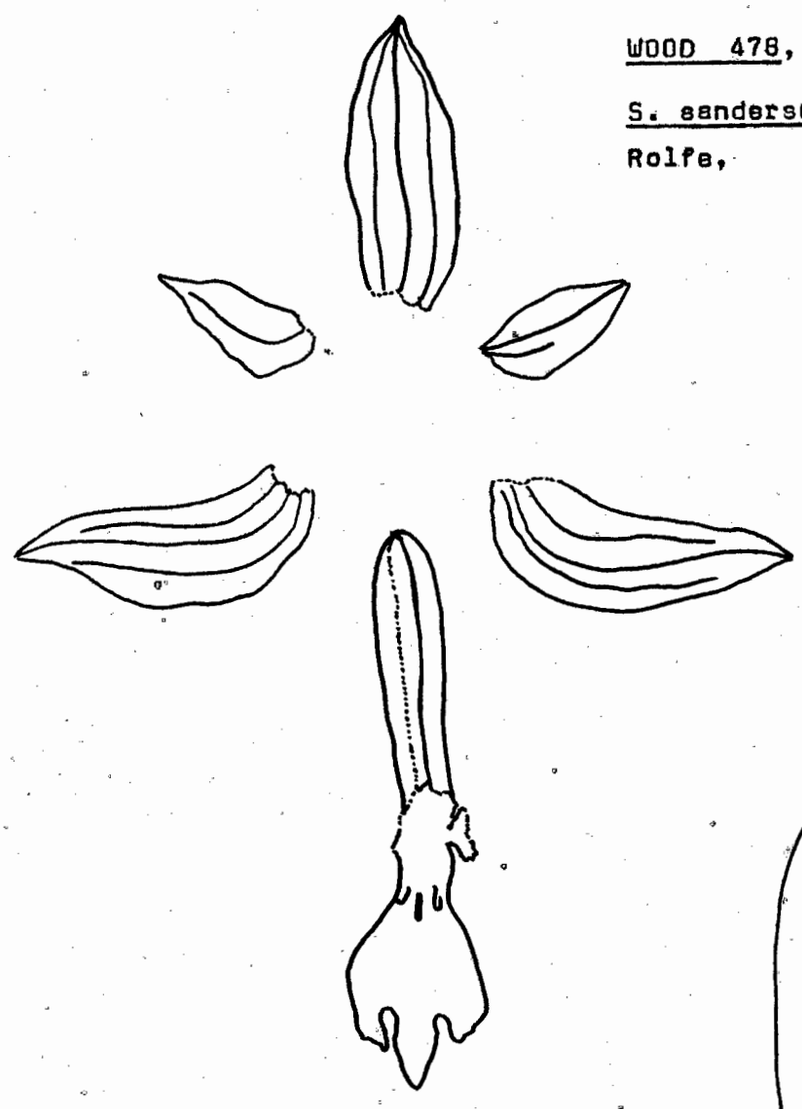
Placed by Schlechter in those long-spurred taxa with broadly ovate petals; but stated to have shorter side lobes to the lip than S. sandersoni.

Johannesburg

Flowers (bright golden yellow)

PRE

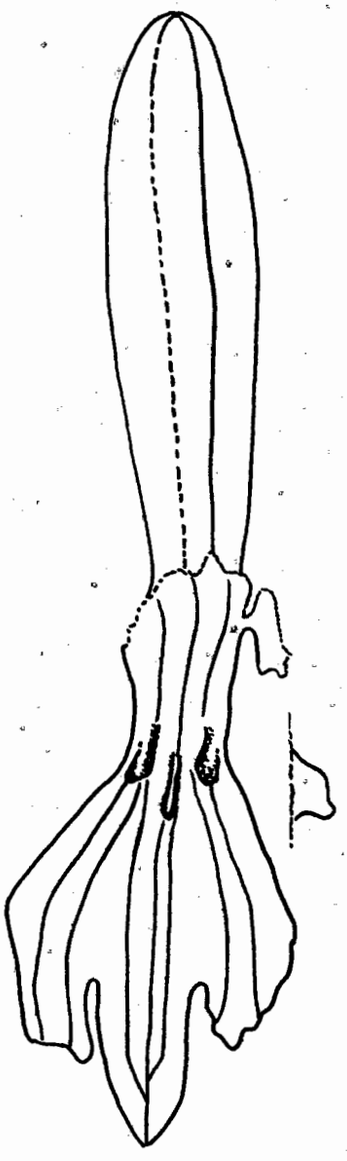
JOHANNESBURG



WOOD 478, Syntype of

S. sandersoni Harv., ex Rolfe,

Flower parts (left) X 6; lip detail below X 12.



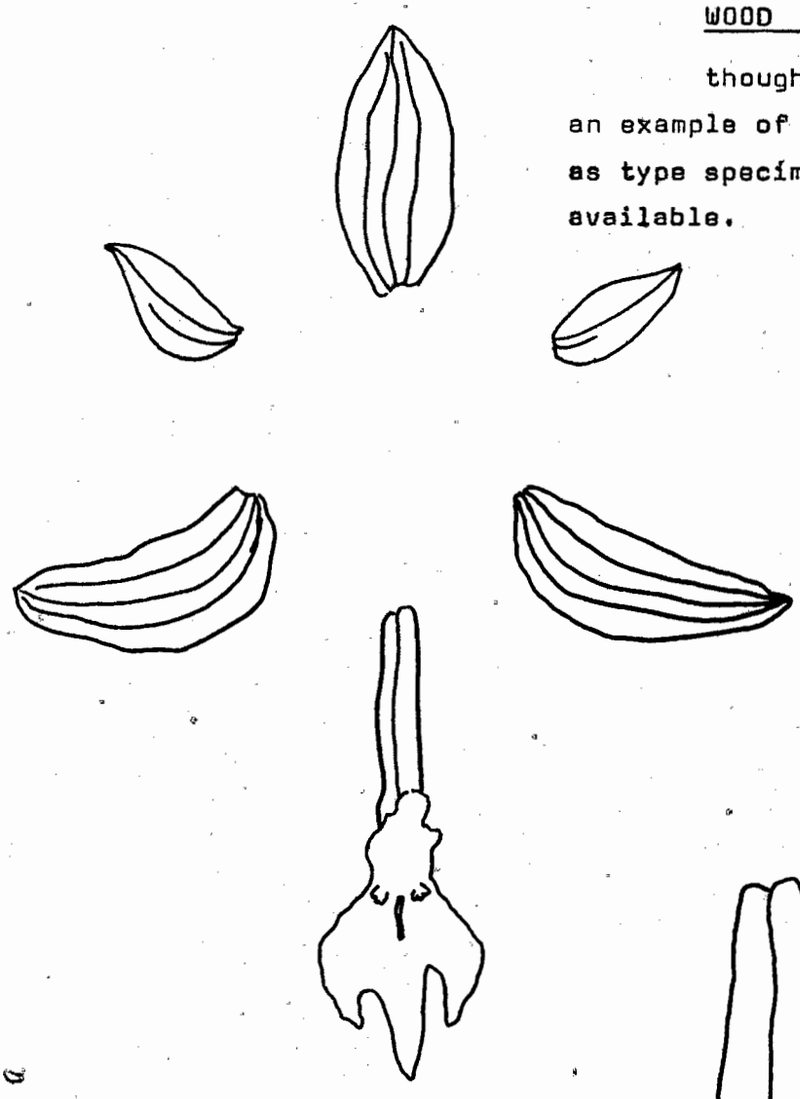
Separated from S. zeyheri by Rolfe on account of longer spur. Schlechter states that petals are broadly ovate, and that the side lobes to the lip are longer than in S. huttonae Schltr.

Inanda

Flowers (yellow)

KEW

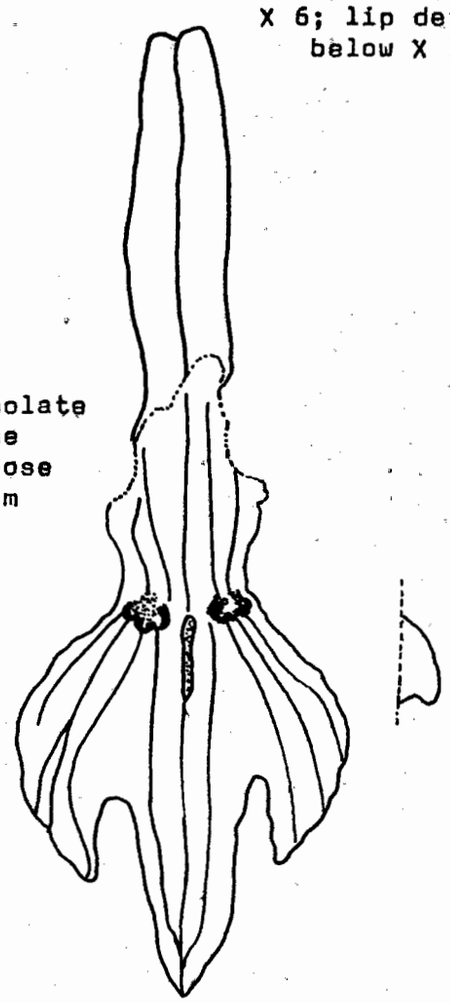
PIETERMARITZBURG



WOOD 9173,

thought probably to be an example of S. woodii Schltr., as type specimen is not available.

Flower parts (left) X 6; lip detail below X 12.



According to Schlechter, with lanceolate petals, and deeply trilobed lip, the lateral lobes being shorter than those of S. rehmanni Rolfe; separated from S. sandersoni virtually only on account of petal shape.

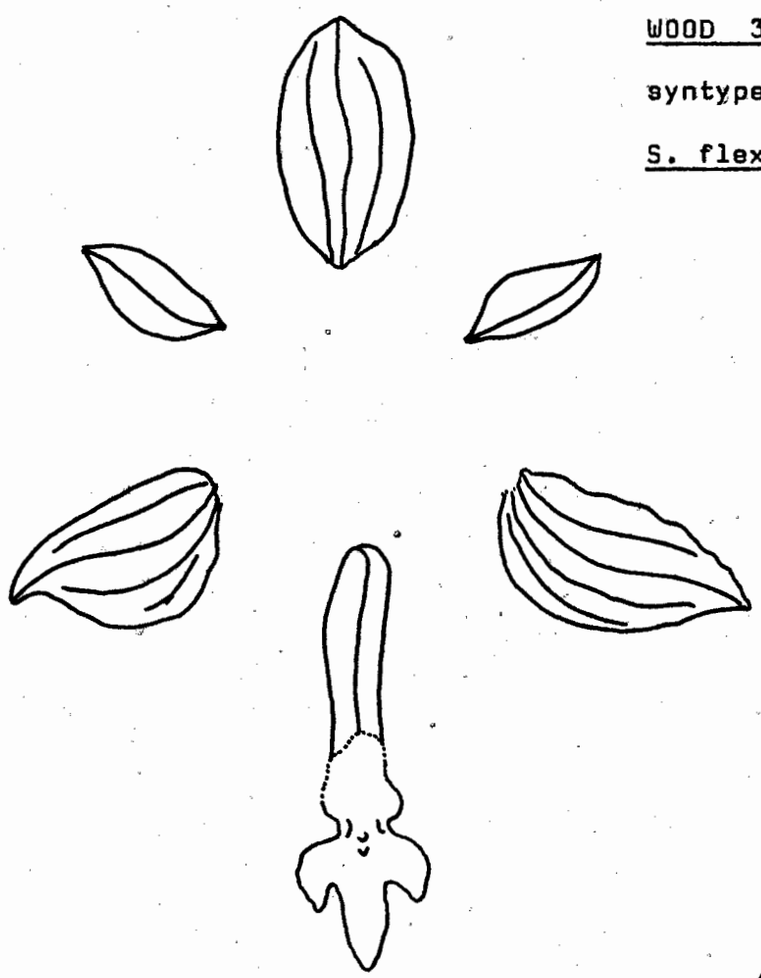
Van Reenen

1525-1830 m.

Flowers yellow

N.U.

HARRISMITH

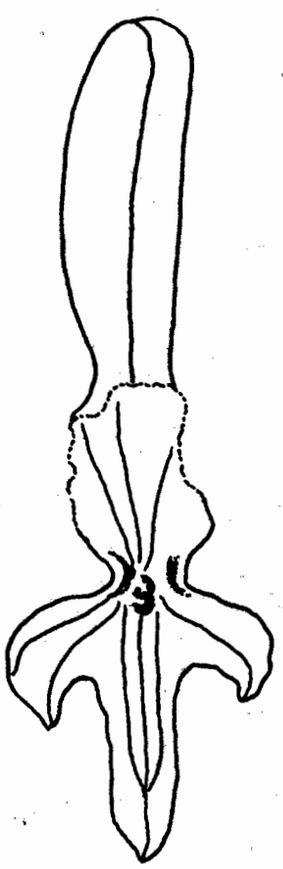


WOOD 3934,

syntype of

S. flexuosus Harv. ex Rolfe.

Flower parts (left) X 6; lip detail below X 12.



Placed by Rolfe in his larger-sepalled group; the long spur and three minute tubercles at the base of the disc are noted.

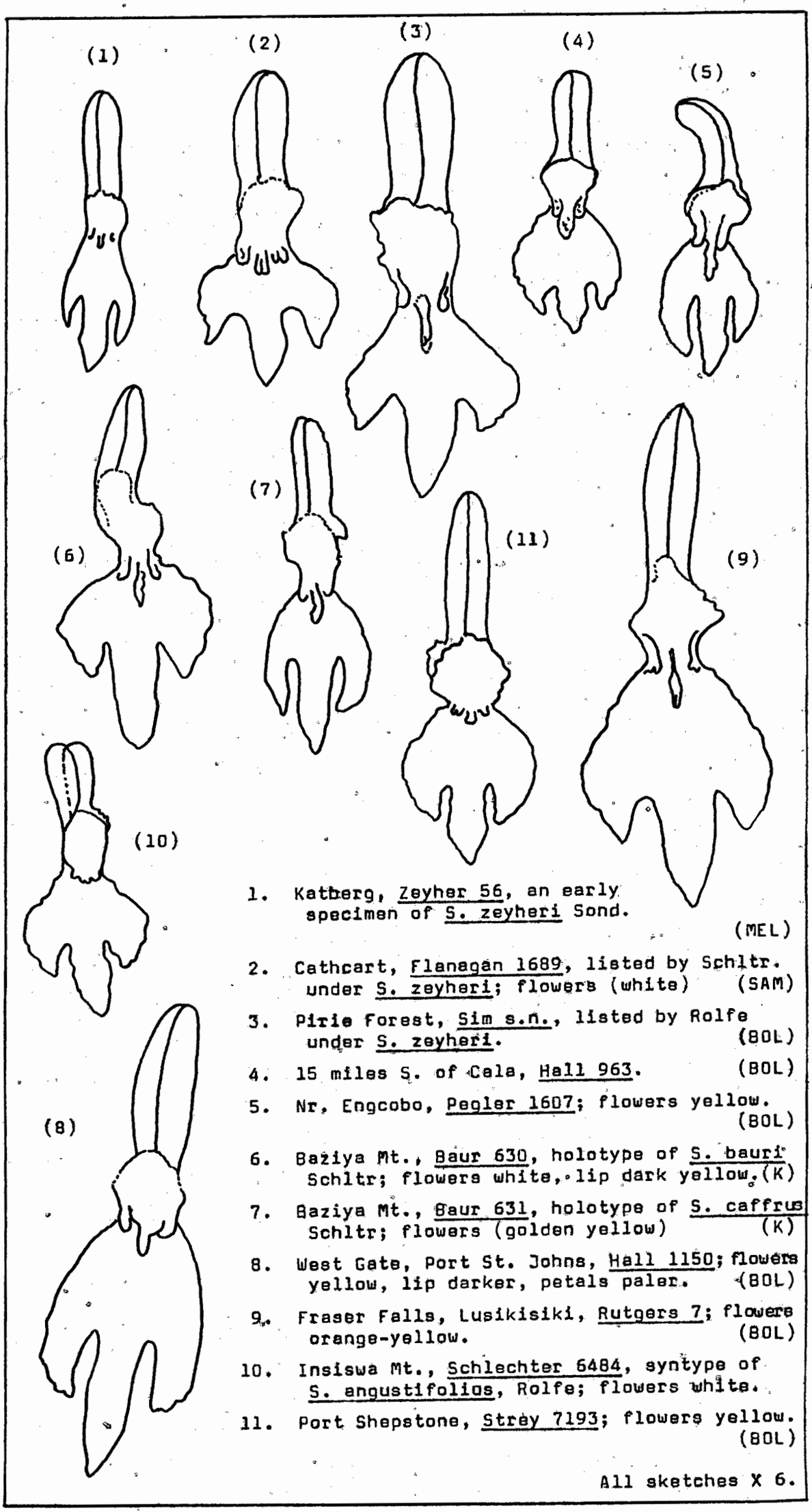
Schlechter never saw these specimens, and thought the species must most closely resemble S. baurii Schltr.

Liddesdale

Flowers white

BOL.

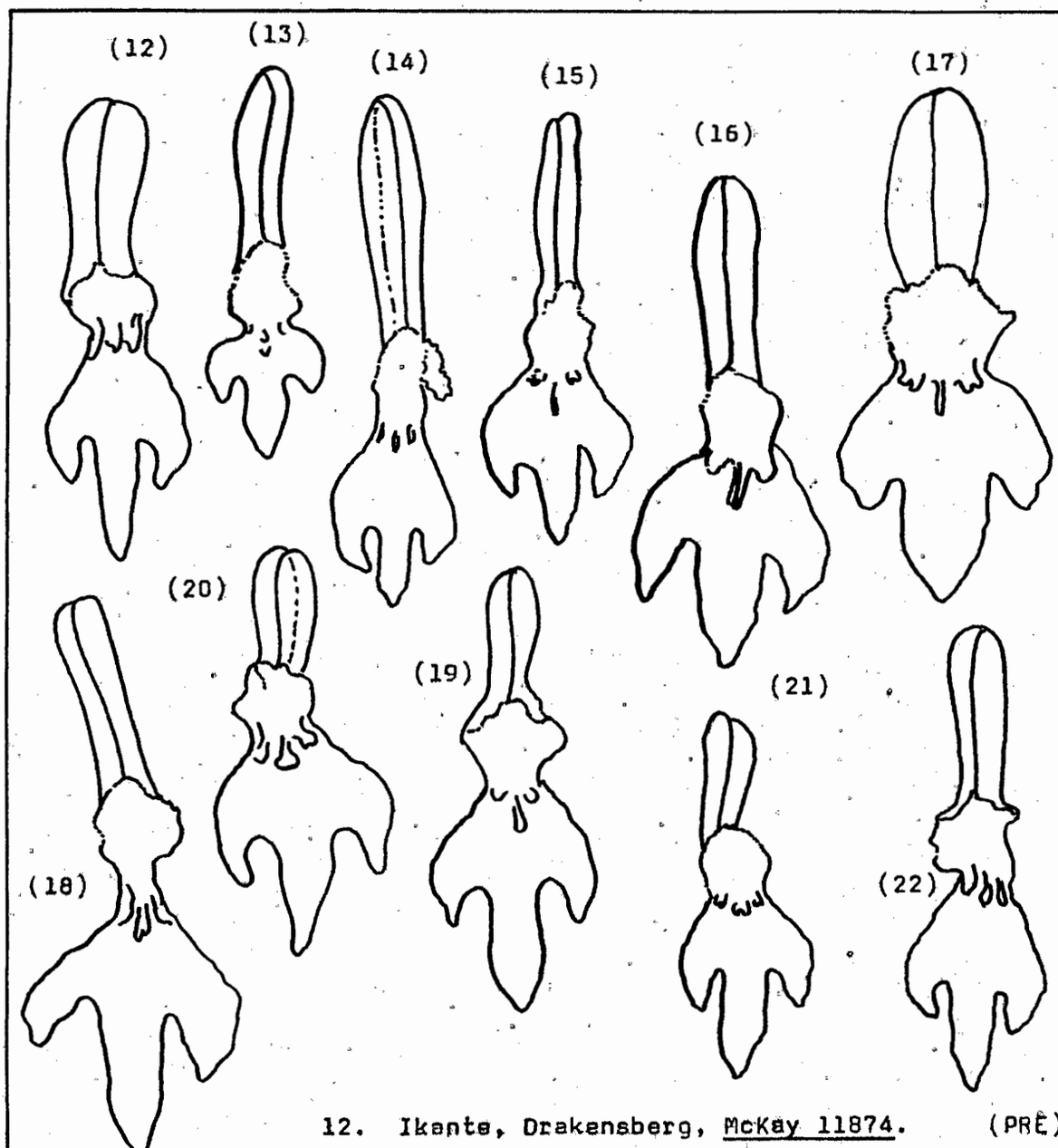
PIETERMARITZBURG



1. Katberg, Zeyher 56, an early specimen of S. zeyheri Sond. (MEL)
2. Cathcart, Flanagan 1689, listed by Schltr. under S. zeyheri; flowers (white) (SAM)
3. Pirie Forest, Sim s.n., listed by Rolfe under S. zeyheri. (BOL)
4. 15 miles S. of Cala, Hall 963. (BOL)
5. Nr. Engcobo, Pegler 1607; flowers yellow. (BOL)
6. Baziya Mt., Baur 630, holotype of S. bauri Schltr; flowers white, lip dark yellow. (K)
7. Baziya Mt., Baur 631, holotype of S. caffrus Schltr; flowers (golden yellow) (K)
8. West Gate, Port St. Johns, Hall 1150; flowers yellow, lip darker, petals paler. (BOL)
9. Fraser Falls, Lusikisiki, Rutgers 7; flowers orange-yellow. (BOL)
10. Insiswa Mt., Schlechter 6484, syntype of S. angustifolius, Rolfe; flowers white.
11. Port Shepstone, Strey 7193; flowers yellow. (BOL)

All sketches X 6.

LIP PATTERNS IN THE S. ZEYHERI COMPLEX I.



12. Ikanta, Drakensberg, McKay 11874. (PRE)
13. Liddesdale, Wood 3934, syntype of S. flexuosus, Harv. ex Rolfe; flowers white. (BOL)
14. Inanda, Wood 478, syntype of S. sandersoni Harv, ex Rolfe; flowers (yellow). (K)
15. Van Reenen, Wood 9173, probably "S. woodii" Schltr; flowers yellow. (NU)
16. Ngoye Forest, Eshowe, Venter 5230; flowers yellow. (PRE)
17. Kongellaan River, Hlobane, D. Johnstone 597; flowers yellow. (NU)
18. Johannesburg, Hutton 275, holotype of S. huttonae Schltr; flowers (yellow). (PRE)
19. Mbabane-Oshoek, Bolus 12321, holotype of S. bolusii Schltr; flowers (yellow). (BOL)
20. Klein Olifant's River, Schlechter 4028, syntype of S. strictus Rolfe; flowers (apparently yellow). (K)
21. Belfast, Doidge s.n., 4799 in Herb. Transv. Dept. Agr; flowers (yellow) (K)
22. Lydenburg, Atherstone 22070. (NBG)
23. Graskop, Hall 864; flowers yellow, spur pale green. (BOL)
24. Houtbosch, Rehmann 5849, syntype of S. rehmanni Rolfe; flowers (orange) (K)

All sketches X 6.

LIP PATTERNS IN THE S. ZEYHERI COMPLEX II.

12. Undescribed Transvaal species:

A. On the 18th November, 1937, a new species of Schizochilus was collected at Station Gorge, Graskop. In the National Herbarium, Pretoria, the specimen is labelled Reynolds 2661, and the large sepals are said to be white, but the petals violet and the lip spotted with violet. It is not certain whether three further sheets from the National Herbarium (one dated 21.11.1937, two merely Dec. 1937) and a sheet from the Bolus Herbarium, dated 2.12.1937, represent a number of subsequent collectings by Galpin or one collecting only. All plants were found among rocks at the edge of the precipice and are described as very local and with white flowers.

On 19.10.1963, Schelpe collected what is obviously the same species at an altitude of 2135 metres on the summit of Long Tom Pass. The flowers are described as white with longitudinal pink stripes.

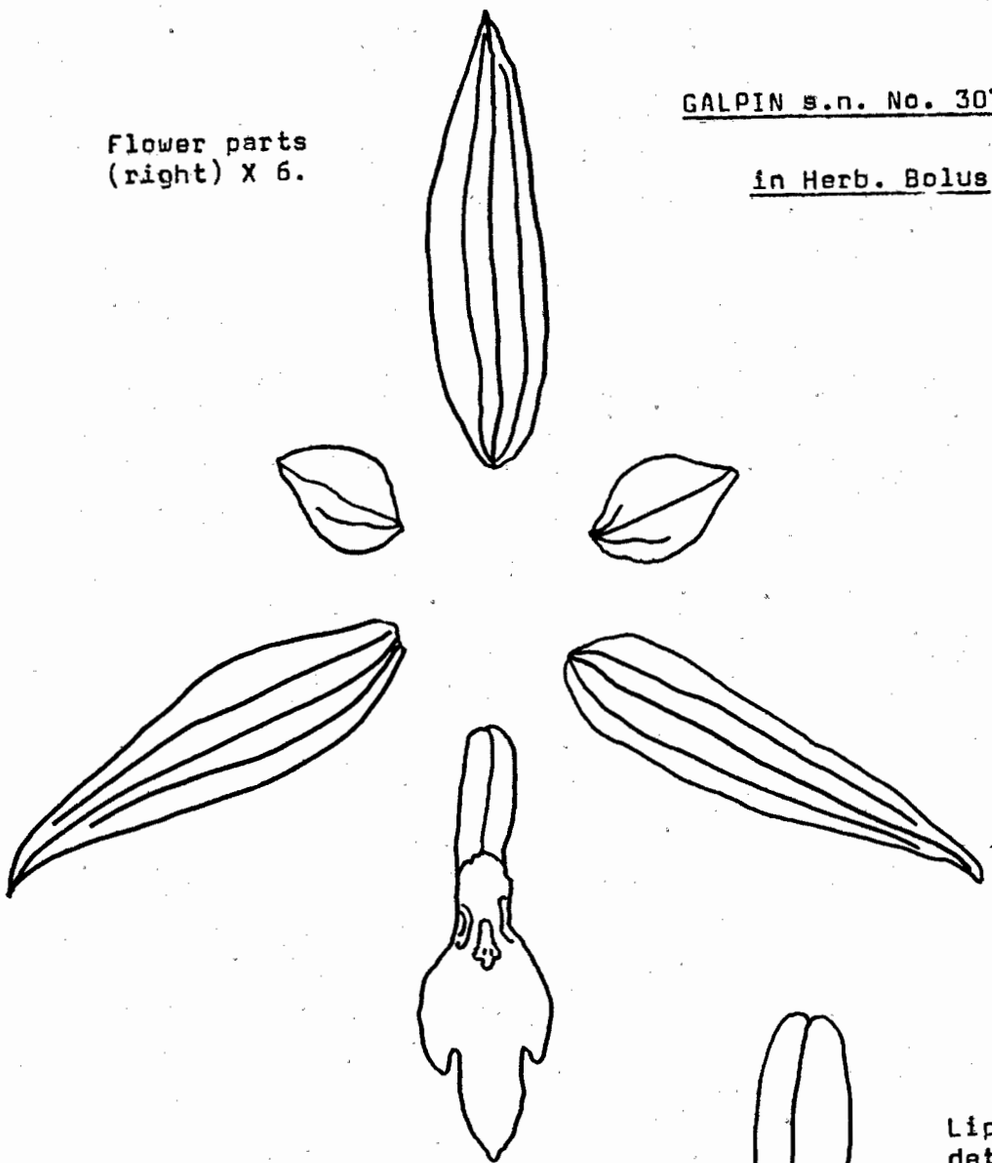
Distinctive features here are the linear-lanceolate sepals, ranging from more than 1,0 cm to almost 2,0 cm in length, and longer than spur and lip together; and the unusual lip outline with extremely short side lobes. Sketches show that the central callus may be considerably extended, with many warty outgrowths. This taxon is very different to anything previously described; see xxvii and xxviii.

B. Flowers with a similar warty keel and purple overtones, but with shorter sepals and a more usual type of lip, were first collected by Galpin in February 1937, near the "Edge of the Berg", Graskop. He has recorded the flowers as white, but mauve colouration is mentioned for Hall 632 (January 1959) and Hall 865 (late December 1961). Purple colouring is apparent in the pressed specimen, Newland 2 (late February 1967). Apart from the colour, these flowers (xxix) do not differ greatly from odd specimens of Schizochilus which crop up in other parts of the country; but further searching in the field, particularly for the former species, would certainly be worth while.

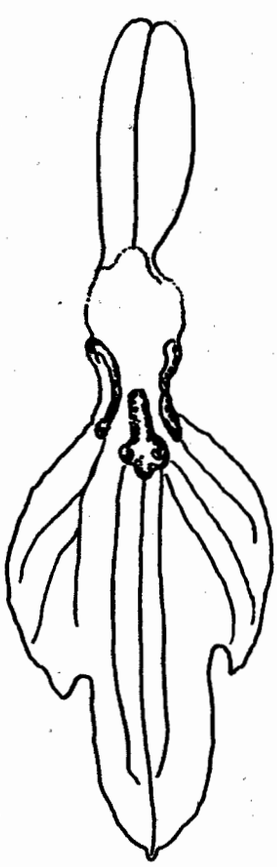
Flower parts
(right) X 6.

GALPIN s.n. No. 30796

in Herb. Bolus.



Lip
detail
X 12.



Station Gorge, at edge
of precipice.

Flowers white.

BOL.

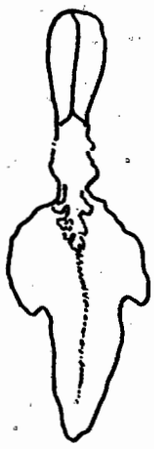
PILGRIM'S REST

PILGRIM'S REST

Flowers pure white

PRE.

Galpin 14558



Flowers white

PRE.

Galpin s.n.

Nat. Herb. 31703

PRE.

Galpin s.n.

Nat. Herb. 31704

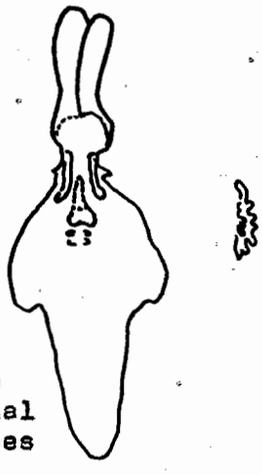
Flowers white

BOL.

Galpin s.n.

Herb. Bol. 30797

LYDENBURG



Flowers white with longitudinal pink stripes

BOL.

Schelpe s.n.

Herb. Bol. 30798

The Galpin specimens from Station Gorge, Graskop, are dated November and December, 1937. It is not quite clear whether they represent one collecting or several.

Schelpe's specimen from Long Tom Pass was collected in October 1963 at an altitude of 2135 m.

All sketches X 6.

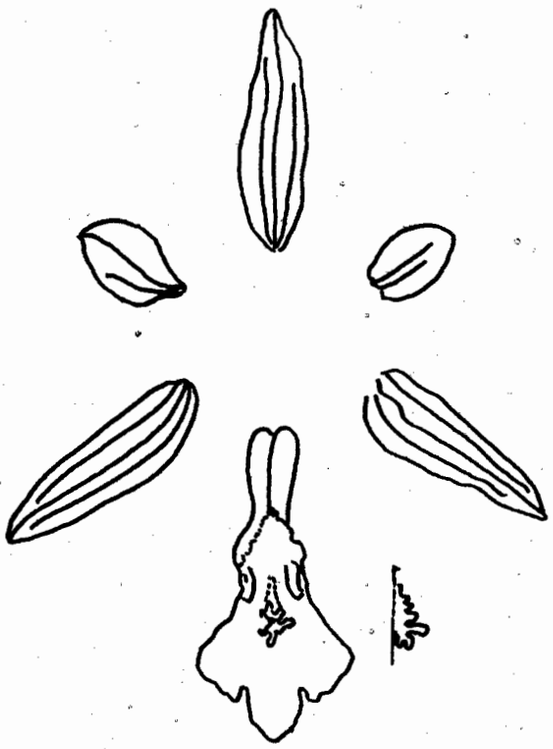
LIP PATTERNS OF UNDESCRIBED TRANSVAAL SPECIES I.

GALPIN s.n., No. 30800

in Herb. Bolus.

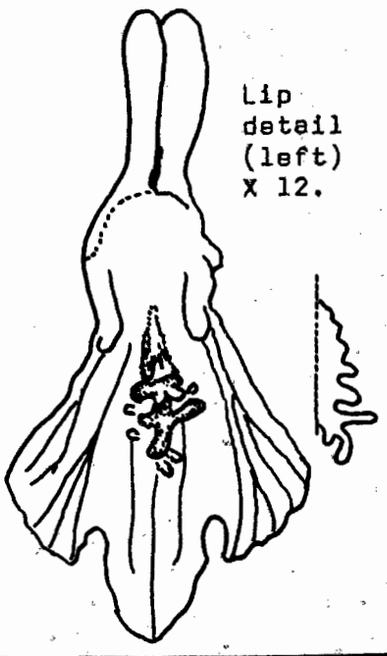
Graskop, near Berg Edge.

flowers white.



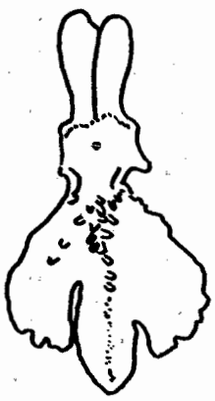
Flower parts X 6.

BOL. X 6



Lip detail (left) X 12.

PILGRIM'S REST



Hall 632

Flowers mauvish white

BOL. X 6

GRASKOP

Hall 865

Flowers white
- pink & purplish markings

BOL. X 6

GRASKOP

Newland 2

(purple spur and petals, purple nerves to sepals)

Pinnacle Rock Falls

PRE. X 6

LIP PATTERNS OF UNDESCRIBED TRANSVAAL SPECIES II.