

# Revision of the South African genus *Chasmanthe* (Iridaceae)

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The genus *Chasmanthe*, which is closely related to *Tritonia* and *Crocasmia*, is indigenous to the Cape Province of the Republic of South Africa. Out of the nine species established by N.E. Brown in 1932 only three, namely *C. aethiopica* (L.) N.E. Br., *C. floribunda* (Salisb.) N.E. Br. and *C. bicolor* (Ten.) N.E. Br., are accepted. Four species have already been transferred to other genera and two are now reduced to synonymy. *C. aethiopica* and *C. floribunda* are abundant in the southern and south-western Cape Province, the former being found as far as the Transkeian border in the eastern Cape Province. *C. bicolor* is rare and has a limited distribution in a few south-western Cape districts. All are adapted to winter rainfall conditions, sprouting in autumn and flowering in spring.

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Die genus *Chasmanthe* wat naverwant is aan *Tritonia* en *Crocasmia*, is inheems in die Kaap-Provinsie van die Republiek van Suid-Afrika. Van die nege spesies wat N.E. Brown in 1932 ingestel het, word slegs drie, nl. *C. aethiopica* (L.) N.E. Br., *C. floribunda* (Salisb.) N.E. Br. en *C. bicolor* (Ten.) N.E. Br., erken. Vier spesies is reeds na ander genera oorgeplaas en die orige twee word nou as sinonieme aangegee. *C. aethiopica* en *C. floribunda* kom algemeen voor in suid- en suidwes-Kaapland, eersgenoemde strekkende tot aan die Transkeise grens in suidoos-Kaapland. *C. bicolor* is skaars, met 'n beperkte verspreiding in enkele suidwestelike Kaaplandse distrikte. Al drie spesies is aangepas aan winterreënvaltoestande en spruit in die herfs en blom in die lente.

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## Introduction

*Chasmanthe* is a small genus (Iridaceae: Ixioideae) endemic in the south-western, southern and south-eastern Cape Province, between longitudes 18° and 29° and latitudes 31°45' and 34°45', the latter being the southern-most tip of Africa.

It is one of six new genera described by N.E. Brown (1932) when he subdivided the large heterogeneous genus *Antholyza*. The name is derived from *chasme* (=gaping) and *anthe*, in allusion to the shape of the flower. He recognized nine species of *Chasmanthe*, four of which were later transferred to other genera where they rightly belong. The present investigation, based on a study of fresh material from the natural habitats and herbarium material from South African and important overseas herbaria, shows that the genus comprises only three species, the other two species admitted by Brown being reduced to synonymy.

Early in the seventeenth century species of *Chasmanthe* were already cultivated in Europe and England, where it was known that they came from Africa. Several workers such as Morison (1680) and Plukenet (1692) illustrated and described a species of *Chasmanthe* under polyonyms. Using one of Morison's adjectives as a specific epithet, Linnaeus in 1759 briefly described a *Chasmanthe* as *Antholyza aethiopica*, the type of which is preserved in his herbarium (LINN). Later *Chasmanthes*, cultivated in Europe and England, were illustrated and described by several other workers also as species of *Antholyza*, and it became known that they originated in the Cape.

The genus is closely related to *Tritonia* and *Crocasmia*. They were placed in tribe Ixieae, subtribe Tritoniineae, by Goldblatt (1971).

## Morphology

### Habit

All species are medium to large, herbaceous, deciduous geophytes varying in height from 250 mm to more than a metre. The underground stem is a tunicated corm, new corms being formed annually to replace the old corms which wither. The species are adapted to winter rainfall conditions. The corms remain dormant throughout the long dry summer months and sprout in autumn after winter rains have started.

In *C. aethiopica* flowering occurs early in the growing season, starting in autumn (April), before the new corm in the base of the shoot has had time to develop. In the other two species flowering starts in July. The plants reproduce by means of seeds and axillary buds on their corms.

### Corm (Figures 1c, 2c, 3c)

The corm, which is usually quite large and up to 70 mm in

diameter in *C. floribunda*, is annual. It is not deep seated and is depressed globose or sometimes almost disc-shaped (*C. floribunda*) or widely conical with a flat or slightly concave base. It consists of five to eight internodes and in this feature it differs from the typical corm of the Ixiaceae which usually has corms with only a few internodes.

A new corm develops late in the growing season from the short basal internodes of the shoot which become swollen with food reserves. The tunics are derived from the leaf bases of the cataphylls and basal foliage leaves attached to this part of the shoot. In *C. floribunda* the intercostal areas disintegrate, leaving the fibro-vascular bundles to form coarse fibres. In the other two species the tunics are thin and papery.

More than one axillary bud may develop into a shoot. A stolon up to 450 mm in length which grows out horizontally and produces a shoot at its tip is often produced. In this way new plants are formed some distance from the parent corm.

#### Aerial stem

The scape is cylindrical and erect, overtopping the leaves with its terminal inflorescence. It is simple (*C. aethiopica*) or sometimes produces one or two or rarely three short branches from the base of the inflorescence. The basal half is covered with imbricate leaf sheaths and the upper part is often purple when growing in full sunlight.

#### Leaves (Figure 1e)

The leaves are equitant and distichous. At the base of the stem three to five bifacial, somewhat membranous cataphylls occur which gradually grade into a number of basal foliage leaves with long bifacial sheaths and long unifacial blades. The few cauline leaves higher up the scape are small and largely bifacial.

The unifacial leaf blades are plane (not plicate), linear-lanceolate or ensiform-lanceolate and acuminate or acute, and have a large number of densely crowded, slender veins and a stronger pseudo-midrib which runs for a large part off centre. The leaves can hardly be distinguished, either morphologically or anatomically, from those of certain species of *Crocasmia*, especially *C. aurea* (cf. De Vos 1984). They have a similar arrangement of vascular bundles, a similar complex pseudo-midrib comprising more than one pair of vascular bundles, and leaf edges strengthened only by a thick walled epidermis.

#### Inflorescence

This is a spike, usually simple or sometimes with one to two or rarely three branches from its base, each bearing numerous flowers. In the bud stage the spike is distichous and the tip usually bends towards the side of maximum light. When fully developed it is erect and remains distichous in *C. floribunda* or becomes secund or semi-secund with an angle of about 90° (or more) between the two rows of flowers in *C. aethiopica* and *C. bicolor*.

The two bracts subtending each flower are equal or subequal in length and cover the ovary and sometimes also part of the tubular portion of the perianth tube. They are largely subherbaceous except for the tip which is often slightly membranous and reddish. The outer bract has obscure veining and varies from ovate or oblong to suborbicular, and from acute to obtuse and then sometimes apiculate or irregularly toothed. The inner bract is invariably bidentate with acute or acuminate teeth; it has two veins and is often slightly two-keeled.

#### Flowers (Figures 1a, 2a, 3a)

Flowering starts in autumn or early winter for *C. aethiopica* and goes on to September for *C. floribunda*. The flowers are protandrous, medianly zygomorphic and curved, and from 55 to 85 mm in length. The long, curved perianth tube is longer than or equal to the longest perianth segment.

An important character which distinguishes the genus from the closely related *Crocasmia* and from other Iridaceae genera is the abrupt manner in which the perianth tube expands from its short tubular basal portion ca. 2 mm in diameter to a wide cylindrical upper portion 5–8 mm in diameter. Pouches, often discernible only in fresh material, occur where the tube expands: *C. floribunda* and *C. bicolor* have a single shallow anticous pouch, whereas *C. aethiopica* has three pouches below the three outer perianth segments. The pouches contain nectar which may also rise to the brim of the perianth tube. Septal nectaries are present in the upper part of the ovary and pollination is usually accomplished by sun birds (see also Werth 1915, p. 344). The perianth tube is grooved and the narrow basal portion is often spirally twisted in a clockwise or anti-clockwise direction, especially in *C. aethiopica*. The mouth of the tube is oblique in *C. aethiopica* and *C. floribunda*; the posticous perianth segment arising some 3–7 mm beyond the anticous segment.

The perianth segments are unequal, with the posticous segment at least twice the length of the other segments. It is porrect, spatulate, arched and slightly concave or longitudinally folded, thus protecting the stamens and style which are placed against it. In *C. aethiopica* and *C. floribunda* the lateral segments are oblong or oblanceolate and recurved or widely spreading; the anticous segment is smallest, suberect and sometimes conduplicately folded. In *C. bicolor* all three outer segments remain erect.

The stamens and pistil are similar in all three species. As in the zygomorphic species of *Crocasmia*, the stamens and style are arched against the posticous perianth segment and often reach its tip or sometimes overtop it.

The anthers are contiguous, dehiscing towards the anterior side of the flower. They are versatile and usually linear but sometimes appear sagittate, being bifid from their bases for almost half their length. They are mostly purple or violet and have pale yellow pollen. The filaments are inserted in the base of the dilated portion of the perianth tube and are grooved or flattened on their inner side. The anticous filament is some 3–5 mm longer than the other two. The latter feature, as well as the attachment of the anthers near the middle, distinguishes the genus from the closely related *Crocasmia* and *Tritonia*.

The trilobular ovary is ellipsoid and has five to nine ovules in the lower half of each chamber. The filiform style has three short spreading branches which bear small, minutely fimbriolate terminal stigmas, except in *C. floribunda* where the stigmas are slightly elongated down the upper half of each style branch.

The capsules are ellipsoid to globose, trilobed or trigonous, and rather woody when ripe. On dehiscing they expose one to six large globular or slightly angled, orange-yellow to brownish-orange seeds 3–7 mm in diameter. The testa comprises a thick outer integument with a large celled, thick walled epidermis. When the seeds ripen the thin walled inner layers of this integument become compressed but, in contrast to *Crocasmia*, do not disintegrate, and the epidermis containing the orange colouring matter remains firmly attached.

#### Chromosomes

Goldblatt (1971) reported diploid numbers of  $2n=20$  in *C.*

*aethiopica* and *C. floribunda* in contrast to  $2n=22$  for the related *Tritonia* and *Crocoshmia*. The chromosomes are small and mostly acrocentric, resembling those of *Tritonia* and *Crocoshmia* in general size and appearance. Goldblatt is probably correct in surmising that an aneuploid reduction must have taken place to produce the karyotype of *Chasmanthe*. A previous chromosome count by Nakajima of  $2n=32$  for *C. aethiopica* was probably for a plant belonging to some other genus, possibly *Tritoniopsis* or *Anapalina* both of which resemble *Chasmanthe* to some extent and have numbers of 32 and 34 — see Goldblatt 1971.

### Geography and Ecology (Figure 4)

Both *C. aethiopica* and *C. floribunda* have a wide distribution, the former ranging from the south-western Cape districts to the south-eastern districts, mostly coastal, as far as Kentani on the border of Transkei, and the latter in the south-western Cape from Caledon to the Gifberg south of Vanrhynsdorp. *C. bicolor*, on the other hand, apparently has a limited range in three south-western Cape districts where it was found only once in each.

Adapted to winter rainfall conditions, *C. floribunda* prefers full sunlight but also occurs in part shade; *C. aethiopica* flourishes under trees as well as in almost full sunlight, for example amongst scrub on coastal sand dunes. Towards the east this species stretches into the summer rainfall region, but it has nevertheless kept to its habit of growing and flowering from autumn to spring.

### Taxonomic history

Two species of *Chasmanthe* grow around Table Bay at the Cape of Good Hope and became known in Europe and England in pre-Linnean times, even before Jan van Riebeeck's arrival at the Cape in 1652. A species of *Chasmanthe* was illustrated and described under polyonyms by several pre-Linnean workers such as Cornut (1635) who did a drawing of '*Gladiolus aethiopicus flore coccineo*' which is possibly *C. floribunda*, Morison (1680) who cited Cornut, and Plukenet (1692) who named his rather poor drawing of a *Chasmanthe* '*Hyacinthus africanus foliis colchici floribus coccineis*'. Cornut also stated that such plants were in flower in 1633 in Paris.

Using Morison's epithet *aethiopicus*, Linnaeus (1759) placed the *Chasmanthe* specimen in his herbarium, together with three other species which are not *Chasmanthe*, in the genus *Antholyza* which he had established in 1737. He briefly described the species as '*Antholyza corollar alis patulis; labio inferiore minore*', and cited Morison. In 1762 he gave a longer description of the species, citing Morison, Cornut, Plukenet and Rudbeck.

Salisbury (1812) realized that more than one species was included in *A. aethiopica*, as then understood. He was not satisfied with the epithet *aethiopica* and wanted to get rid of it altogether, calling it an 'absurd name . . . for they all grow wild at the Cape of Good Hope'. He established two species, namely, (i) *A. vittigera* with citations Bot. Mag. t. 1172, Bot. Rep. t. 32 and Cornut, and (ii) *A. floribunda*, based on Bot. Mag. t. 561 and Bot. Rep. t. 210.

In the late eighteenth century and during the nineteenth century three more names were established for species of *Chasmanthe*, namely, *A. ringens* Andrews (1797) which is *C. aethiopica*; *A. praealta* Red. (1813) which is *C. floribunda*; and *A. bicolor* Gasp. ex Tenore (1845), a new species.

During the nineteenth century the treatment of *Chasmanthe* (as *Antholyza*) varied considerably: some workers combined *C. aethiopica* and *C. floribunda* under *A. aethiopica*. Ker-

Gawler (1827), for example, placed *A. ringens* Andr. and *A. praealta* together, and Baker (1877), who was first to take notice of Salisbury's names, placed *A. floribunda* with *A. aethiopica* and established two varieties, namely, var. *ringens* and var. *bicolor* for Andrew's and Gasparini's species, respectively; but in 1892 and 1896 he cited *A. ringens* as a synonym of *A. aethiopica* and named three varieties, viz., var. *immarginata* (Thunb. herb., ined.), var. *vittigera* (Salisb.) and var. *bicolor* (Gasp.).

Klatt (1882) treated *A. praealta* as distinct from *A. aethiopica* and in this he was followed by Marloth (1915).

The name *Chasmanthe* was established in 1932 by N.E. Brown when he revised and split the large heterogeneous genus *Antholyza* L. into nine separate genera. In his key to these genera he distinguished *Chasmanthe* as having the upper perianth lobe long and concave or hooded, leaves linear or ensiform, not pleated, bracts 8–20 mm, rarely half as long as the perianth tube and often shorter than the slender part of it; capsules longer than the bracts, ellipsoid, firm, seeds angular and winged or compressed, smooth and wingless. He listed nine species. (His description of long bracts and winged or compressed seeds refers to those species which were later transferred to other genera — see below).

Brown's treatment of the genus *Antholyza* was later modified; firstly by Hutchinson (1934) who merged *Chasmanthe* with *Petamenes*, and secondly by Phillips (1941) who, on examination of the specimens in PRE named by Brown, found that the latter had 'gone too far in proposing so many new genera'. Phillips thereupon merged four genera, *Petamenes*, *Kentrosiphon*, *Chasmanthe* and *Anomalesia* under the oldest name *Petamenes* Salisb., as all four genera have a much elongated, concave or hooded upper perianth segment. The subsidiary differences between these four genera were, according to him, slight and did not merit generic status. He upheld this view in his 'Genera of S. African Flowering Plants' (1951).

In 1950 Lewis re-established two of the above-mentioned four genera, namely, *Chasmanthe* and *Anomalesia*, for those species occurring in the Cape Peninsula, and in 1954 she further showed that the genus *Chasmanthe* is well defined and distinct from *Petamenes* and that it is closely related to *Tritonia* and *Crocoshmia*. In 1960 she transferred two species, *C. caffra* and *C. intermedia* to *Anapalina*, convinced that they belong there.

Goldblatt (1971), after studying the karyotypes of the Iridaceae, largely confirmed Lewis's views and found that, although *Chasmanthe* resembled *Petamenes* in general floral morphology, it differed in its bracts, seeds, style and stigmas and also in its karyotype; he therefore also retained *Chasmanthe* as distinct and upheld this in 1976.

Two more species of *Chasmanthe* named by Brown (1932) were later transferred to other genera: *C. spectabilis* to *Petamenes* by Sölch and Roessler (1966) and to *Oenostachys* by Goldblatt (1971); and *C. fucata* to *Crocoshmia* by De Vos (1984). This left five species in *Chasmanthe*. In the present revision two of these are now placed in the synonymy of *C. aethiopica*, leaving only three species in the genus.

### Relationships and Origin

Lewis (1954) was first to show the relationship between *Chasmanthe*, *Crocoshmia* and *Tritonia*. In her phylogenetic scheme (p. 102) she placed *Tritonia* and *Crocoshmia* on two neighbouring lines emanating from one hypothetical ancestor; from the *Crocoshmia* line two lines diverge terminating in *Chasmanthe* and *Curtonus*, respectively. That means she

regarded *Crocoshmia*, the monotypic *Curtonus* and *Chasmanthe* as being more closely allied to one another than to *Tritonia*, and *Crocoshmia* as being more primitive than either *Chasmanthe* or *Curtonus*. (*C. paniculata*, now merged with *Crocoshmia*, is the most advanced species of the latter genus.)

Goldblatt's morphological and cytological work on the Iridaceae (1971) bears out this treatment, and I also found *Crocoshmia* and *Chasmanthe* to be more closely related to each other than to *Tritonia* (De Vos 1984). Both *Chasmanthe* and *Crocoshmia* have large, many-noded corms; the foliage leaves of the former can hardly be distinguished from those of species of *Crocoshmia* with plane (not plicate) leaves. The flowers of *Chasmanthe* resemble those of the advanced species of *Crocoshmia* to a remarkable degree in their strongly zygomorphic perianths, long perianth tubes and much elongated posticous segments which are porrect and much larger than the other segments, and which are concave or hooded to protect the stamens. Both genera have few ovules occupying the lower half of the ovary chambers and few seeds with thick testas.

*Chasmanthe* differs from *Crocoshmia* mainly in its abruptly widened perianth tube which has one or three pouches; in its stamens one of which is longer than the other two, all three anthers being split almost to the middle; in its orange-yellow to brownish-orange seeds with firm outer testa; and also in its annual corms.

## Taxonomy

*Chasmanthe* N.E. Br. in Trans. R. Soc. S. Afr. 20: 272 (1932) in part; L. Bol. in S. Afr. Gard. 23: 46 (1933); G.J. Lewis in Adamson & Salter, Fl. Cape Penins. 264 (1950) & in Ann. S. Afr. Mus. 40: 71, 97 (1954); Phill. Gen. S. Afr. Flow. Pl. 221 (1951) as syn.; Goldbl. in JI S. Afr. Bot. 37: 424 (1971) & in Dyer, Gen. Southern Afr. Flow. Pl. 2: 974 (1976); De Vos in JI S. Afr. Bot. 50: 473 (1984).

*Antholyza* L. Syst. Nat. ed. 10, 863 (1759) in part, excl. spp. *ringens*, *canonia*, *meriana*, & Sp. Pl. ed. 2: 54 (1762) in part, excl. same spp.; Aiton, Hort. Kew. ed. 2, 1: 103 (1810).

*Petamenes* (Salisb.) sensu Hutch. Fam. Flow. Pl. 2: 140 (1934) in part, excl. spp. *abbreviata* & *caffra*; sensu Phill. in Bothalia 4: 44 (1941) in part, excl. syn. *Kentrosiphon* & *Anomalesia*; & Gen. 221 (1951) in part, excl. same syn.; non Loudon (1841), nec N.E. Br. (1932).

Type species: *C. aethiopica* (L.) N.E. Br.

Deciduous, medium-sized or tall geophytes. *Corm* annual, 5–8-noded, medium to large, widely conical, depressed globose or almost disc-shaped; tunics membranous or coarsely fibrous. *Stem* erect, strong, cylindrical, lower half covered with imbricate leaf sheaths. *Foliage leaves* several, mainly basal, large, unifacial, equitant, linear-lanceolate or ensiform, plane, glabrous, acuminate or acute, with closely crowded slender veins; cauline leaves few, small, largely bifacial. *Inflorescence* a large many-flowered, distichous or secund or subsecund spike, sometimes with 1–2(–3) basal branches. *Bracts* small, subherbaceous, equal or subequal, partly covering the tubular portion of the perianth tube; *outer* acute or obtuse and often apiculate; *inner* bidentate, 2-veined. *Flowers* strongly zygomorphic, curved, largely orange-red or vermillion, rarely yellow or partly green. *Perianth tube* long, curved, tubular and often spirally twisted in the lower quarter, dilating abruptly to cylindrical, often with an oblique mouth; *segments* usually obtuse, unequal, the posticous segment largest, porrect, long-spathulate, other segments small, mostly spreading or recurved, the anticous segment smallest, suberect. *Stamens* well exerted from the perianth tube, arched against the posticous segment, one slightly longer than the other two;

*anthers* versatile, linear or somewhat sagittate, unilateral, contiguous, bifid from the base almost to the middle. *Ovary* ellipsoid, small, with 5–9 ovules per chamber; *style* long, filiform, with three short spreading branches; *stigmas* three, minute, terminal or slightly elongated. *Capsules* ellipsoid or subglobose, 3-lobed or 3-angled, rigid when dry; *seeds* 1–6 per chamber, large, globose or slightly angled, testa orange-yellow to brownish-orange, with a thick persistent outer integument. *Chromosome number*  $2n = 20$  (Goldblatt 1971).

## Key to the species

1. Lateral perianth segments (7–)10–20 mm long, spreading or recurved, orange-red or sometimes yellow; mouth of perianth tube oblique, the upper segment arising some 3–7 mm beyond the lower one:
  2. Perianth tube abruptly truncate to its wider upper portion, with three deep pouches; spike simple, secund or subsecund, with 7–15 flowers ..... 1. *C. aethiopica*
  2. Perianth tube more rounded where it expands into its wider upper portion, with a single shallow pouch which is often hardly discernible; spike distichous, often with 1–2 basal branches, usually with 20–40 flowers ..... 2. *C. floribunda*
1. Lateral perianth segments 5–8 mm long, the two outer segments erect, red or greenish-pink; mouth of perianth tube with segments arising at about the same level ..... 3. *C. bicolor*

1. *Chasmanthe aethiopica* (L.) N.E. Br. in Trans. R. Soc. S. Afr. 20: 273 (1932); G.J. Lewis in Adamson & Salter, Fl. Cape Penins. 264 (1950) & in Ann. S. Afr. Mus. 40: 96 (1954); Goldbl. in JI S. Afr. Bot. 37: 424 (1971).

*Antholyza aethiopica* L. Syst. Nat. ed. 10, 2: 863 (1759) & Sp. Pl. ed. 2, 54 (1762); Bak. in J. Linn. Soc. 16: 179 (1877) in part, excl. cit. Bot. Mag. 561, Andr. (1803) & syn. *A. floribunda* Salisb. (1812) & *A. praealta* Red. (1812); Marloth, Fl. S. Afr. 4: 160 (1915); Pole Evans, Flow. Pl. S. Afr. 8 t. 309 (1928); non Burm. f. (1768), nec Thunb. (1794, 1807), nec Ker-Gawl. (1802), nec Andr. (1803), nec Klatt (1863). Type: s. loc., LINN 60.3, holotype.

*Petamenes aethiopica* (L.) Phill. in Bothalia 4: 44 (1941).  
*A. aethiopica* var.  $\beta$  Ker-Gawl. in Curtis's Bot. Mag. 29 t. 1172 (1809).  
*A. vittigera* Salisb. in Trans. Hort. Soc. 1: 324 (1812). Syntypes: Curtis's Bot. Mag. t. 1172 (lectotype), Andr. Bot. Rep. t. 32.  
*A. aethiopica* L. var. *vittigera* (Salisb.) Bak. Handb. Irid. 230 (1892) & in Fl. Cap. 6: 167 (1896).

*Chasmanthe vittigera* (Salisb.) N.E. Br. in Trans. R. Soc. S. Afr. 20: 274 (1932).

*Petamenes vittigera* (Salisb.) Phill. in Bothalia 4: 44 (1941).  
*Antholyza ringens sensu* Andr. Bot. Rep. 1 t. 32 (1797), hom. illeg., non L.

*A. aethiopica* L. var. *ringens* (Andr.) Bak. in J. Linn. Soc. 16: 179 (1877). Type: Andr. Bot. Rep. 1 t. 32 (lecto-).

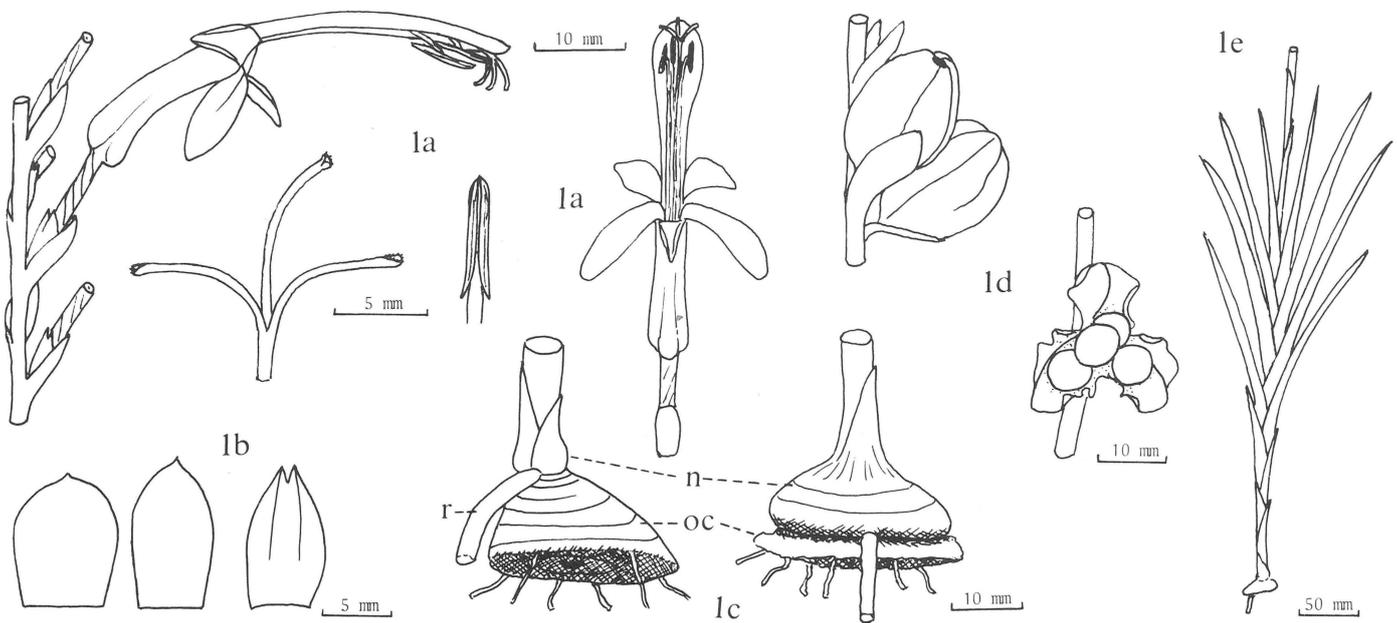
*A. immarginata* Thunb. Herb. sheet  $\beta$  (= *Thunb. 1100*, UPS), ined.  
*A. aethiopica* L. var. *immarginata* Thunb. ex Bak. Handb. Irid. 230 (1892) & in Fl. Cap. 6: 167 (1896). Type: *Thunb. Herb. 1100* (UPS, lecto-, here chosen).

*A. praealta sensu* Loudon, Ladies Fl. Gdn. Orn. Bulb. Pl. 40 (1841), excl. Red. (1813); non Red., nec Roem. & Schult. (1817), nec Marloth (1915).

*Chasmanthe peglerae* N.E. Br. in Trans. R. Soc. S. Afr. 20: 273 (1932). Type: Cape, Kentani Div. near Black Rock Cove, *Pegler 500* (K, holotype; BOL, PRE).

*Petamenes peglerae* (N.E. Br.) Phill. in Bothalia 4: 44 (1941).  
 Icones: Red. Lil. 2 t. 110; Curtis's Bot. Mag. 29 t. 1172; Marloth Fl. S. Afr. 4 t. 49A; Flow. Pl. S. Afr. 8 t. 309; Kidd, Wild Flrs Cape Penins. t. 19/5; Lewis in Ann. S. Afr. Mus. 40 t. 23/1,2; this work Figure 1.

*Plants* (250–)400–700(–900) mm high. *Corm* somewhat disc-shaped or widely and sometimes asymmetrically conical, up to 35 mm, rarely to 45 mm diam., developing after flowering has started; tunics at first membranous, later largely fibrous. *Scape* (250–)400–700(–900) mm, ca. 4 mm diam. *Basal foliage leaves* 6–8, linear or linear-lanceolate, acute or



**Figure 1** *Chasmanthe aethiopica*. (a) Flower, anther and stigmas; (b) left and centre, outer bract; right, inner bract; (c) corms: left, at anthesis; right, later; (d) capsules; (e) plant.

acuminate, erect to suberect, (150–)400–600(–800) × (10–)12–18(–25) mm, soft textured, with a prominent middle vein and numerous slender, closely spaced veins. *Spikes* simple, secund to subsecund, (100–)150–180 mm with (7–)10–15 flowers. *Bracts* subherbaceous, largely green, upper part reddish and later submembranous, 8–12(–15) × 7–10 mm; *outer* ovate or shortly oblong or rarely suborbicular, acuminate to obtuse-apiculate or sometimes irregularly toothed; *inner* ovate, minutely bidentate. *Flowers* zygomorphic, curved, (55–)60–80 mm long, orange-red (RHS 33A), with yellow stripes on the perianth tube and maroon in the throat. *Perianth tube* (25–)30–40 mm, the basal tubular part (5–)7–10(–15) mm long, often spirally twisted, the upper portion (16–)20–25(–28) × 4–6 mm, with an oblique mouth and three pouches where it expands (distinct in fresh specimens); *segments* obtuse, the median posticous segment porrect, curved, oblanceolate-spathulate, (22–)25–35 × 7–10 mm, sometimes with slightly wavy margins, arising 4–7 mm beyond the lowest segment; lateral segments (7–)10–15(–18) × 4–7 mm, oblong or oblanceolate, spreading or recurved, with the two inner segments slightly larger than the outer; anticous segment smaller, often somewhat conduplicate. *Filaments* 40–50 mm; *anthers* slightly sagittate, 5–7 mm long, purple or almost black, reaching the perianth tip. *Ovary* 5–8 mm long; *style* (45–)55–65(–75) mm, branches 4–5 mm long; *stigmas* minute, terminal, often overtopping the anthers and perianth. *Capsules* ellipsoid, trigonous or trilobed, nodose, 15–25 mm long, rounded at the apex; *seeds* 2–4(–6) per chamber, subglobose, orange, 5–7 mm diam. *Chromosome number* 2n = 20 (Goldblatt 1971).

Flowering period: April to July (to August).

Distribution: South-western to south-eastern Cape coastal districts (Figure 4).

CAPE. — 3227 (Stutterheim): Dohne (–CD), *Sim* 19889, 19936 (PRE).

3228 (Butterworth): Near Kei mouth (–CB), *Flanagan* 190 (BOL, GRA, PRE); Kentani coast, *Pegler* 500 (BOL, PRE, K).

3318 (Cape Town): Darling Flora Res. (–AD), *Rycroft* 1928 (NBG); Rosebank (–CD), *Pillans* 10633 (G); Kirstenbosch, *Lewis* 2290 (SAM);

Camps Bay, *Thode* A164 (PRE); Cape Town, *Marloth* 169b (PRE); Montis Diaboli, *Bolus* 4747 (BOL, NBG, K, Z); Devils Peak, *W. Dod* 2656 (BOL, K); Montis Tabularis, *MacOwan* 1550 (G, K, Z); Table Mt., *Zeyher* SAM 21511 (SAM); Nr Vygekraal, *Zeyher* PRE 37868 (PRE); Diep River (–DA), *Van Breda* 1162 (PRE); Modderkloof (–DB), *Van Wyk* 558 (PRE); Stellenbosch (–DD), *Zeyher* s.n. (K), *Duthie* 686 (STE); Van der Stel, Stellenbosch, *Smith* 4200 (PRE); Eersterivier wandelpad, Stellenbosch, *de Vos* 2583 (STE); Jonkershoek, *Kerfoot* 5831, 5304 (STE).

3320 (Montagu): Keurkloof (–CC), *Compton* 8735 (NBG, STE); Tradouw Pass (–DC), *Goldblatt* 1716 (MO).

3322 (Oudtshoorn): Near Swart River (–DC), *SAAS* 400 (NBG); Fairy Knowe, Wilderness, *Compton* 10730 (NBG).

3324 (Steytlerville): 25 mls W of Patensie (–DB), *Wurts* 2106 (NBG).

3325 (Port Elizabeth): Sandflats (–BD), *Flanagan* 190 (GRA); Port Elizabeth (–DC), *Kemsley* 331 (Z); *Paterson* 621 (BOL); *Dahlstrand* 3041 (STE).

3326 (Grahamstown): Pone Howieson's Poort (–BC), *Pappe* SAM 21508 (SAM), *Ecklon & Zeyher* 4022 in part (PRE); *MacOwan* 1619 (SAM); *MacOwan* s.n. (K); Coldspring (–AD), *J.-Guillarmod* 9484 (GRA); *Rennie* 263 (BOL); S of Mountain Drive (–BC), *Dyer* 448 (PRE, Z); Grahamstown, *MacOwan* 619 (K); *Rogers* 1577 (G); Grahamstown Nature Res., *Richardson* 39 (GRA); Alexandria (–CB), *Galpin* 10759 (PRE); *Galpin* BOL 32548 (BOL); Kowie (–DB), *Tyson* PRE 37876 (PRE); *Britten* PRE 37886 (PRE); Port Alfred, *Rogers* 17152 (Z); *Giffen* FH 2334 (BOL).

3327 (Peddie): East London sea coast (–BB), *Galpin* 1840 (PRE).

3418 (Simonstown): Cape Peninsula (–AB/–AD) *Rogers* 16966 (G); Bergvliet farm (–AB), *Purcell* SAM 90207, 90206 (SAM); Tokai, *Morris* 92 (NBG); Constantia, *Prior* s.n. (Z); *Prior* PRE 37928 (PRE); Swartklip sand dunes (–BA), *Taylor* 8106 (STE); Isoetes Vlei, *Gubb* 120 (NBG); Somerset West (–BB), *Parker* 3681 (NBG); Strand, *Parker* 3671 (BOL, NBG); Hottentots-Holland, *Zeyher* 4022 (SAM); Hangklip (–BD), *Boucher* 1538 (STE); *Stokoe* SAM 60131 (SAM).

3419 (Caledon): Hermanus (–AC), *Pole Evans* PRE 37930 (PRE); Drayton (–BA), *Goldblatt* 339 (BOL); Genadendal, *Roser* PRE 15425 (PRE); Danger Point (–CB), *Lewis* 2289 (SAM, STE); Elim (–DA/–DB), *Schlechter* 7686 (K, G, Z).

3420 (Bredasdorp): Sparrbosch at Buffeljagts River (–AA), *Drège* 8340 (K); Vogelvlei (–CA), *Middlemost* NBG 64802 (NBG); Nachtwacht, *Smith* 4257 (PRE).

3421 (Riversdale): Banks Vet River (–AA), *Muir* 278 (PRE); Stilbaai (–AC), *Bohnen* 5772 (PRE, STE); Oude Tuin near Albertinia (–BA), *Muir* 906 (BOL); Albertinia to Mossel Bay (–BB), *Van Breda* 1104 (BOL, PRE).

3422 (Mossel Bay): Betw. Mossel Bay and Zoute River (–AA), *Burchell* 6339 (K); Lake Pleasant (–BB), *Schijff* 10 (PRE); Groenvlei, *Martin*

4427 (PRE); Goukamma, *Heinecken 71* (PRE); Sedgfield to Groenvlei, *Geldenhuys 296* (BOL).

**3423** (Knysna): Seashore Ratelsbos, *Fourcade 246* (GRA); Knysna (-AA), *Bayliss 1446* (NBG, G, Z); Melville, *Burchell 5422* (K); 11 mls W of Knysna, *Lewis 5762* (NBG); Robberg (-AB), *Taylor 1259* (SAM); Keurbooms strand, *Compton 23547* (NBG).

**3424** (Humansdorp): Uitvlugt, *Fourcade 2608* (BOL, STE, K); Seekoeivlei (-BB), *Montgomery 409* (STE); Astonbaai, *de Vos 2582* (STE). **3425** (Skoenmakerskop): Cape Recife (-BA), *Olivier 2276, 2828* (GRA); Skoenmakerskop, *Urton 263* (GRA); *Dahlstrand 142* (PRE).

WITHOUT PRECISE LOCALITY: *Pappe s.n.* (K); *Ecklon SAM 37556* (SAM); *Ecklon & Zeyher 68* (= Zwartland, Riebekkasteel & Paardeberg) (MO, Z); *Barber s.n.* (Eastern Frontier) (K).

*C. aethiopica* is readily distinguished by its simple, secund or subsecund spike with 7–15 flowers each with a perianth tube which has three deep pouches and an abruptly truncate base to its dilated upper portion.

There is a considerable and continuous variation in leaf width from about 10 to 25 mm, sometimes even in single populations such as *Smith 4200* in PRE, from Stellenbosch. Specimens with wide leaves were regarded as a separate species, *C. vittigera*. Another feature ascribed to *C. vittigera* was a distichous spike, as seen in Bot. Mag. t. 1172 and in some herbarium specimens. I do believe, however, that the apparently distichous spike of herbarium specimens is an illusion of a subdistichous (or subsecund) spike pressed down in a distichous manner. A study of the species in nature showed that the position of the flowers on the spike is influenced by the direction of light; plants under trees where light is unilateral show a large proportion of secund spikes. Moreover, specimens with truly distichous spikes have not been found in nature. On account of the above considerations *C. vittigera* is combined with *C. aethiopica*.

*C. peglerae* differs from *C. aethiopica* only in its shorter and wider, elliptic or suborbicular outer bracts which are 'very obtusely, almost truncately rounded at the apex' (Brown 1932). As a continuous series of intermediates from the typical longer bracts of *C. aethiopica* to the shorter and wider bracts of *C. peglerae* have now been found, this species also cannot be upheld.

Several authors of the nineteenth century were unable to distinguish between *Antholyza aethiopica* and *A. floribunda* and combined the two species under *A. aethiopica*, e.g. Roemer & Schultes (1817), Ker-Gawler (1827) and Baker (1877, 1892, 1896). Thunberg also combined the two species he had in his herbarium as *A. immarginata*, an unpublished name, and misidentified (1794, 1807), as *A. aethiopica*, two different species which are now *Anapalina caffra* and a species of *Engysiphon* (see also Brown 1928).

According to Lewis (1950) it is probable that hybrids can occur between *C. aethiopica* and *C. floribunda*. The illustration in Rice & Compton (1951 t. 221) shows the spike of *C. aethiopica* and perianth tube of *C. floribunda*. Whether this was a hybrid, is not known. I was able to distinguish between the two species in all herbarium specimens except two.

**2. Chasmanthe floribunda** (Salisb.) N.E. Br. in Trans. R. Soc. S. Afr. 20: 274 (1932).

*Plants* 500–1 200(–1 500) mm high. *Corm* large, depressed globose or almost disc-shaped, 60–70 mm diam.; tunics of several imbricate layers of coarse, parallel (lower half) and reticulate (upper half) fibres. *Scape* 500–1 200(–1 500) mm long, 7–8 mm diam. *Basal foliage leaves* 8–10, lanceolate-ensiform, acuminate, erect to suberect, in a large, distichous fan-like arrangement, (250–)300–500(–800) × (18–)25–35(–50) mm, rather firm in texture, with a prominent middle

vein and numerous slender closely spaced veins. *Spike* distichous, dense, ca. 300 mm long, at first somewhat pyramid-shaped, with (25–)30–40 or more flowers, often with 1–2 basal branches. *Bracts* largely subherbaceous, oblong, maroon or reddish-green, 13–15 × 5–7 mm; *outer* obtuse or almost truncate, with a wide membranous tip; *inner* bidentate, the acuminate teeth with membranous margins. *Flowers* zygomorphic, curved, 70–85 mm long, orange-red (RHS 33A) or primrose-yellow. *Perianth tube* (35–)45–50 mm long, the basal tubular portion 9–12 mm long, sometimes slightly twisted, the upper portion curved, (25–)30–38 × 5–8 mm, with an oblique mouth and a shallow anticous pouch (best seen in fresh specimens), orange-red, often with yellow stripes, or primrose-yellow; *segments* obtuse, the median posticous segment oblanceolate-spathulate, slightly concave, 30–33 × 8–10 mm, arising 3–5 mm beyond the lowest segment; lateral segments 12–20 × 4–7 mm, oblong, spreading or recurved; anticous segment smaller, often suberect, later somewhat conduplicate. *Filaments* 50–60 mm; *anthers* linear, 7–8 mm long, dark purple or yellow, sometimes overtopping the perianth. *Ovary* 6–9 mm long; *style* 65–80 mm, branches 7–10 mm long; *stigmas* slender, slightly elongated down the style branches, sometimes overtopping the anthers and perianth. *Capsules* globose-trilobed with an apical nipple, often dark purple, 10–15 mm diam.; *seeds* 1–4 per chamber, subglobose or slightly angled, orange, 5–7 mm diam. *Chromosome number* 2n=20 (Goldblatt 1971).

Flowering period: July to September.

Distribution: South-western Cape districts from Vredendal to Caledon. Specimens found at Knysna may perhaps be garden escapes (Figure 4).

*C. floribunda* differs from *C. aethiopica* in its large flattened corm which has coarse reticulate fibres on its upper half, and in its large, dense, distichous spike with 20–40 or more flowers, each with a single shallow anticous pouch at the base of the wide distal portion of the perianth tube. In herbarium specimens the pouch is usually indistinct. The dilation of the tube is not as truncate and abrupt as in *C. aethiopica*. The species differs from *C. bicolor* in its corm, the oblique mouth of its perianth tube, and in its concolorous perianth segments.

Two varieties occur which differ chiefly in flower colour. The typical variety is widespread, but var. *duckittii* has a small local distribution on a few farms south of Darling.

*C. floribunda* is now cultivated in numerous south-western Cape gardens, including the National Botanic Gardens at Kirstenbosch where large stands of both varieties are in flower from July to August. This is possibly the species that was grown in England and Europe in pre-Linnean times and illustrated by Cornut (1635) and others under polyonyms.

#### Key to the varieties

Flowers orange-red; anthers dark purple ..... a. var. *floribunda*  
Flowers primrose-yellow; anthers yellow to brownish-yellow .....  
..... b. var. *duckittii*

#### a. var. *floribunda*

*Chasmanthe floribunda* (Salisb.) N.E. Br. in Trans. R. Soc. S. Afr. 20: 274 (1932); L. Bol. in S. Afr. Gard. 23: 46 (1933); G.J. Lewis in Adamson & Salter, Fl. Cape Penins. 264 (1950) and in Ann. S. Afr. Mus. 40: 97 (1954).

*Antholyza floribunda* Salisb. in Trans. Hort. Soc. Lond. 1: 324 (1812). Type: Curtis's Bot. Mag. 16 t. 561 (1802), lectotype. See below.

*Petamenes floribunda* (Salisb.) Phill. in Bothalia 4: 44 (1941).

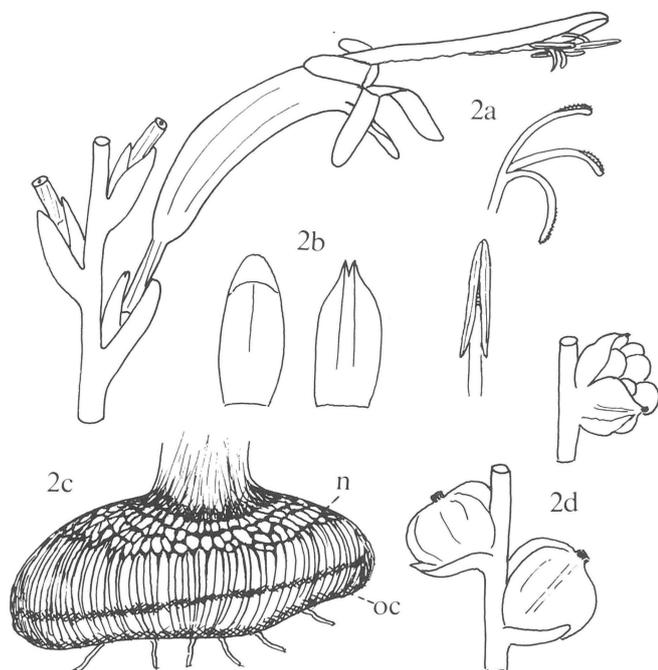
*Antholyza aethiopica sensu* N.L. Burm. Prodr. Fl. Cap. 1 (1768), fide N.E. Br. in Kew Bull. 1929: 130; *sensu* Lam. Encycl. 1: 201 (1783); *sensu* Ker-Gawl. in Curtis's Bot. Mag. 16 t. 561 (1802), in part, excl. cit. L. & Thunb. & syn. *Gladiolus pyramidalis* & *A. ringens*; *sensu* Andr.

Bot. Rep. 3 t. 210 (1803); *sensu* Loudon, Ladies Fl. Gdn. Orn. Bulb. Pl. 39 & t. 8/2 (1841), excl. syn. *A. ringens*; *sensu* Bak. Hand. Irid. 230 (1892) & in Fl. Cap. 6: 167 (1896), both in part, excl. all var. & *A. ringens*; non L. (1759, 1762), nec. Thunb. (1794, 1807).

*A. praealta* Red. Lil. 7 t. 387 (1813); Klatt in Abh. naturf. Ges. Halle 15: 345 (1882); Roem. & Schult. Syst. Veg. 1: 446 (1817); Marloth, Fl. S. Afr. 4: 159 (1915), nom. superfl.; non Loudon (1841). Type: Red. Lil. 7 t. 387, lectotype.

*A. immarginata* Thunb. Herb. sheet  $\alpha$  (= Thunberg 1099, UPS), ined.

Icones: Curtis's Bot. Mag. t. 561; Andr. Bot. Rep. 3 t. 210; Red. Lil. 7 t. 387; Mason, Western Cape Sandveld Flowers t. 32/3; this work Figure 2.



**Figure 2** *Chasmanthe floribunda*. (a) Flower anther and stigmas; (b) left, outer bract; right, inner bract; (c) corm; (d) capsules.

Type: When Brown (1932) transferred *A. floribunda* Salisb. to *Chasmanthe*, he named specimens in K gathered by Pappe on Lion Mountain and by MacOwan near Cape Town (*Hb. Austr. Afr. 1549*) as his type material. These specimens must be regarded as neotypes, as Salisbury (1812) had cited Ker Bot. Mag. t. 561 and Andrews Bot. Rep. t. 210 when he established the species. These figures are syntypes taking precedence over Brown's types. I now choose the former figure as lectotype.

*Flowers* orange-red (RHS 33A), often with yellow stripes down the perianth tube. *Anthers* dark purple.

CAPE. — **3118** (Van Rhynsdorp): Near Bergkraal betw. Lamberts Bay & Vredendal (–CD), *Lewis 4429* (SAM); Gifberg (–DC), *Phillips 7525* (SAM, STE); Olifants River Valley near Nardouw rd., *Lewis 1355* (SAM).

**3218** (Clanwilliam): 5 mls from Clanwilliam towards Lamberts Bay (–BB); *Davis SAM 60130* (SAM, STE, MO); St Helena (–CA/–CC), *Cooper s.n.* (K); De Hoek, Piketberg (–DD), *Bond 1030* (NBG).

**3219** (Wuppertal): Betw. Karooport & Calvinia, *Leipoldt BOL 032546* (BOL); Brandewynrivier E of Pakhuis Pass (–AA), *Lewis 2291* (SAM).

**3318** (Cape Town): Postberg Nature Res. (–AA), *Boucher 2798* (STE); Hopefield (–AB), *Lewis 5976* (STE); Darling (–AD), *Rogers 11094* (PRE, Z); Betw. Mamre & Darling, *Leipoldt SAM 55689* (SAM); Malmesbury (–BC/–DA), *Penberthy 24539* (BOL); Mamre Hills (–CB), *Compton 14481* (NBG); Tafelberg & Duiwels (–CD), *Krauss s.n.* (G); Table Mt., *Drège 8338* (K); Prope Cape Town, *MacOwan HAA 1549* (K, SAM); Mt. Tabularis, *MacOwan 1549* (G, Z); Lion

Mt., *Pappe s.n.* (K); Van Kamps Bay, *MacOwan 3/1884* (K); Camps Bay, *Strey 548, 548b* (PRE); Stinkwater, *Rehman 1193* (Z); Dassenberg, NE slopes of Kanonkop (–DA), *Boucher 4422* (PRE, STE); Paarl (–DB), *Prior s.n.* (K); Paarlberg, *Loubser 871* (NBG); Paardeberg, *Pillans 7641* (BOL); Tygerberg Nature Res. (–DC), *Loubser 3038* (MO); Langverwacht, *Oliver 4337* (PRE, STE); Protea Heights, Stellenbosch (–DD), *Mathews 248* (PRE); Blaauwklippen Valley, *Siegfried PRE 623399* (PRE); *de Vos 2575* (STE).

**3319** (Worcester): Du Toitskloof Pass (–CA), *Goldblatt 227* (BOL).

**3418** (Simonstown): Prom. bonae spei (–AB/–AD), *Wilms 3689* (K); Kalk Bay mts. (–AB), *Goldblatt 2142* (NBG, PRE, MO); Klaasjagers (–AD), *Minicki SAM 61049* (SAM); Karbonkelberg, *Compton 13634* (BOL, NBG); Kogel Bay (–BD), *Boucher 1352* (PRE, STE); Porter Res. Bettys Bay, *Ebersohn NBG 92713* (NBG).

**3419** (Caledon): Caledon (–AD), *Orchard 555* (STE); Genadendal (–BA), *Roser PRE 15422* in part (PRE).

**3423** (Knysna): Knysna (–AA), *Parkes NBG 47/54* (NBG).

Without precise locality: *Willdenow Herb. 949* (B); *Pappe SAM 21544*; *Thom s.n.*, *Rogers s.n.* (K); *Sims*, Hort Kew. (K); *Webb s.n.* (GRA); Hort. Kirstenbosch, *Thorns NBG 64818*.

Foreign: Jard. de la Laguna, Teneriffe (K); Mt. Lofty range, S. Australia, *Kraehenbuehl 2385* (B), *Eichler 18703* (NBG); Adelaide, S. Australia, *Symon 535* (B). All garden escapes.

**b. var. duckittii** G.J. Lewis ex L. *Bol.* in S. Afr. Gard. 23: 47 (1933); E. du Plessis in Mason, Western Cape Sandveld Flrs, 86 (1972). Type: prope Darling, fired at Kirstenbosch, *F. Duckitt s.n. NBG 419/27* (BOL, holotype).

Icones: Mason, W. Cape Sandveld Flrs t. 32/2.

*Flowers* Primrose-yellow. Lower portion of perianth tube slightly shorter than in var. *floribunda*. *Anthers* primrose-yellow, later becoming brownish-yellow.

*Flowering time*: July.

*Distribution*: Confined to a small area south of Darling.

CAPE. — **3318** (Cape Town): Duckitt farm, Darling (–AD), *Axelsson 32* (NBG); Darling, ex hort. Kirstenbosch, *Duckitt NBG 419/27* (BOL).

Without precise locality: *Penberthy, BOL 24539* (BOL); ex hort. Durbanville, *Krige NBG 208/59* (NBG).

**3. Chasmanthe bicolor** (*Gasp. ex Tenore*) N.E. Br. in Trans. R. Soc. S. Afr. 20: 273 (1932).

*Antholyza bicolor* Gasp. in Annali civili Napoli Fasc. 4 (1833); Tenore in Cat. del real orto bot. Napoli 78 (1845); E. Morr. in Belg. Hortic. 2: 145 (1852). Type: Belg. Hortic. 2 t. 25/1, lectotype.

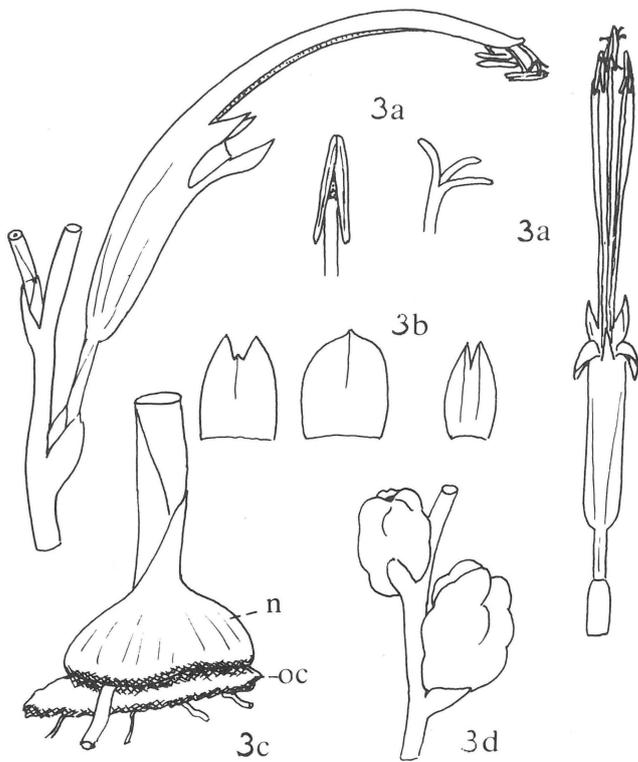
*Petamenes bicolor* (Gasp. ex Tenore) Phill. in Bothalia 4: 44 (1941).

*Antholyza aethiopica* L. var. *bicolor* (Gasp.) Bak. in J. Linn. Soc. 16: 179 (1877) & Handb. Irid. 230 (1892) & in Fl. Cap. 6: 167 (1896).

*A. aethiopica* L. var. *minor* Lindl. Bot. Reg. 14 t. 1159 (1828) in part, excl. syn. Type: Bot. Reg. t. 1159, lectotype.

Icones: Belg. Hort. 2 t. 25/1 & p. 147 t. 2–13; Bot. Reg. 14 t. 1159; this work Figure 3.

*Plants* 700–1 300 mm high. *Corm* somewhat depressed globose, 20–25 mm diam. at time of flowering; tunics thin, membranous. *Scape* 700–1 000(1 300) mm long, 3–5 mm diam. *Basal foliage leaves* 6–7, ensiform, acuminate, erect to suberect, 500–800 × (17–)25–35 mm, soft textured, often with a silky sheen, with a slender middle vein and numerous faint, closely spaced veins. *Spike* slender, subsecund, rather lax, (150–)250–300 mm long, with (12–)20–28 flowers, often with 1–2 basal branches, the top of the main branch bending in the bud stage. *Bracts* subherbaceous, membranous towards the tip, 6–10 mm long; *outer* suborbicular, concave, 8–10 mm wide, obtuse-apiculate or later splitting irregularly, maroon, largely enfolding the inner bract; *inner* oblong, 4–5 mm wide, bidentate. *Flowers* zygomorphic, curved, largely cylindrical, (60–)70–80 mm long, vermilion (RHS 44A) and yellowish-green with vermilion,



**Figure 3** *Chasmanthe bicolor*. (a) Flowers, anther and stigmas; (b) left and centre, outer bract; right, inner bract; (c) corm; (d) capsule, before dehiscence (n — new corm; oc — old corm; r — contractile root. Enlargements of Figures 2 and 3 as in Figure 1).

dark red or greenish-pink and green segments. *Perianth tube* 30–33 mm long, vermilion and yellowish-green, the basal tubular portion 6–10 mm long, sometimes slightly twisted, the upper portion curved, (17–)20–25 × 5–7 mm; *segments* arising at about the same level, the median posticous segment porrect, longitudinally folded, linear-spathulate, obtuse, (27–)30–40 × 6–7 mm, vermilion; other segments subequal in length, 5–8 mm long, acute to subobtuse, with the three outer segments erect, dark red or greenish-pink, and the two lateral inner segments at first erect, later spreading or recurved, green, sometimes red-margined. *Filaments* (40–)50–65 mm; *anthers* sagittate, 6–7 mm long, dark purple, sometimes overtopping the perianth. *Ovary* 5–7 mm long; *style* (50–)65–80 mm, branches 3 mm long; *stigmas* minute, terminal, maroon or purple, overtopping the perianth and often also the anthers. *Capsule* ellipsoid-trilobed, nodose with a rounded apex, 15–20 mm long; *seeds* 1–6 per chamber, subglobose, orange, 3–5 mm diam.

Flowering period: July to early September.

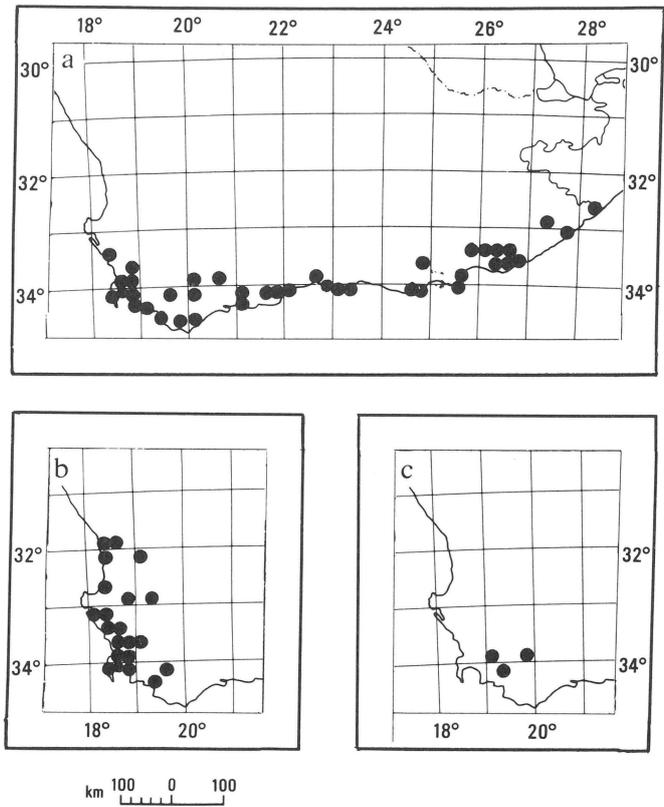
Distribution: South-western Cape, districts of Robertson, Caledon and Franschhoek, very rare.

CAPE. — 3319 (Worcester): Franschhoek (–CC), *Hugo NBG 1459/28* (BOL, NBG); Vrolijkheid to McGregor (–DD), in gorge, *Jooste 177* (STE).

3419 (Caledon): Caledon Wild Flower Show, *Leighton BOL 21248* (BOL).

Without precise locality: S. coll. (K); *Foster 3/88* (K); ex hort. Kirstenbosch, *Goldblatt 466* (BOL); SW Cape, hort. bot. Dahlem, *Schlechter s.n.* (B); Ex hort. Malan, Stellenbosch, *de Vos 2578* (STE).

*C. bicolor* is distinguished by a long and very narrow, curved perianth with the large posticous segment folded lengthwise into a semicylinder, sheathing the stamens and style. The five smaller segments are about equal in size and considerably smaller than in the other two species of the genus; the three



**Figure 4** Distribution of *Chasmanthe* species. (a) *C. aethiopica*; (b) *C. floribunda*; (c) *C. bicolor*.

outer segments remain erect and are red or greenish-pink and the two inner ones later become recurved from their bases and are green. The species further differs from *C. aethiopica* in its rounded base to the expanded portion of the perianth tube and its single very shallow pouch, and from *C. floribunda* in its smaller corm.

According to Lindley (1828) the species had long been an inhabitant of European gardens and Morren (1852) mentioned that it was cultivated in the botanic gardens of Naples and Liège. In South Africa it was cultivated at Kirstenbosch; and it still grows in a garden in Franschhoek and in Stellenbosch where it has been maintaining itself for about 30 years.

In the wild it is very rare, as only two or possibly three herbarium specimens are from natural habitats. The latest collection is that of Jooste in STE who found it in 1971. An extensive search for it during the spring of 1984 was unsuccessful.

#### Excluded species

*Chasmanthe caffra* (Bak.) N.E. Br. in *Trans. R. Soc. S. Afr.* 20: 273 (1932) is *Anapalina caffra* (Bak.) G.J. Lewis in *Jl S. Afr. Bot.* 26: 68 (1960).

*C. fucata* (Herb.) N.E. Br. *ibid.* p. 274 is *Crocospmia fucata* (Herb.) de Vos in *Jl S. Afr. Bot.* 50: 494 (1984).

*Chasmanthe intermedia* (Bak.) N.E. Br. *ibid.* p. 273 is *Anapalina intermedia* (Bak.) G.J. Lewis in *Jl S. Afr. Bot.* 26: 66 (1960).

*C. spectabilis* (Schinz) N.E. Br. *ibid.* p. 274 is *Petamenes zambesiacus* (Bak.) N.E. Br., f. Merxmuller, *Prodr. Fl. Südwestafrika* 155: 12 (1966). This is now *Oenostachys zambesiacus* (Bak.) Goldblatt in *Jl S. Afr. Bot.* 37: 443 (1971).

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