

FSA contributions 11: Zingiberaceae

R.M. SMITH*

Editor’s note: *Hedychium coronarium* and *Siphonochilus kirkii* have been added by Mrs C. Archer, with the author’s consent.

Rhizomatous herbs; rhizome usually fleshy, sympodial, each element terminating in a leafy or flowering shoot. *Leaf shoots* with few to many blades, either arranged spirally and with tubular sheaths (Costoideae) or distichously arranged, sheaths then usually open on side opposite lamina (Zingiberoideae). *Inflorescence* occasionally surrounded by sterile bracts, terminal on leaf shoot or borne directly on rhizome at base of leaf shoot or remote from it. *Flowers* zygomorphic, hermaphrodite or (rarely) unisexual, solitary in axils of bracts or in cincinni, with or without bracteoles. *Calyx* tubular, often unilaterally split. *Corolla tube* usually slender; petals 3, often subequal. *Labellum*: (anterior staminode) often large and showy; lateral staminodes usually present, either as conspicuous petaloid organs (Zingiberoideae/Hedychieae) or as small subulate teeth or swellings (Zingiberoideae/Alpineae). *Fertile stamen* one only; anther more or less sessile or with a distinct filament; thecae parallel or slightly divergent, connective sometimes developing into an appendage (anther crest). *Ovary* inferior, unilocular with parietal placentation or trilocular, or incompletely so with axile placentation; style filiform, upper part usually held between thecae; stigma usually expanded. *Epigynous glands* (stylodes) forming erect outgrowths on top of ovary in Zingiberoideae; in Costoideae, three septal nectary glands arise towards top of ovary. *Fruit* a dehiscent capsule or fleshy berry. *Seeds* arillate.

Over 40 genera and about 1000 species occurring mainly in the tropics of the Old World but with some representatives in South and Central America. Four genera, all belonging to the subfamily Zingiberoideae, are found in the African continent but only one, *Siphonochilus* (tribe Hedychieae), is native in the FSA area. Three species of *Hedychium* (tribe Hedychieae) and *Alpinia zerumbet* (tribe Alpineae) have become naturalised in certain areas.

The Zingiberaceae is notable for its spice plants and includes ginger, *Zingiber officinale*; cardamom, *Elettaria cardamomum*; and turmeric, *Curcuma longa*. Cultivated races of *Curcuma* are common in the Indian markets of KwaZulu-Natal and are not infrequent in gardens; they are used medicinally or powder from the tubers is used as a cosmetic.

- 1a Inflorescence borne separately from leaf shoot; flowers purple-pink, blotched with yellow in centre of labellum, sometimes unisexual 1. *Siphonochilus*
- 1b Inflorescence terminal on leaf shoot; flowers yellow and white or red and yellow, hermaphrodite:

- 2a Inflorescence erect; corolla tube 50–90 mm long, slender; lateral staminodes petaloid 2. *Hedychium*
- 2b Inflorescence pendulous; corolla tube under 20 mm long; lateral staminodes reduced to small subulate teeth 3. *Alpinia*

1. SIPHONOCHILUS

Siphonochilus J.M.Wood & Franks in Medley Wood, Natal plants 6,3: t. 560, 561 (1911a); J.M.Wood & Franks: 274 (1911b); B.L.Burt: 369, t. 1 (1982). Type species: *S. natalensis* J.M.Wood & Franks [= *S. aethiopicus* (Schweinf.) B.L.Burt].

Cienkowskia Schweinf.: t. 1 (1867), non Regel & Rach: 48 (1859).

Kaempferia subgen. *Cienkowskia* K.Schum.: 67 (1904).

Cienkowskiella Y.K.Kam: 8 (1980).

Inflorescence borne separately from leaves, sometimes precocious, long pedunculate or peduncle very short. *Flowers* usually hermaphrodite, rarely unisexual, each subtended by a bract; bracteoles absent. *Calyx* 3-lobed, unilaterally split. *Petals* linear-lanceolate. *Labellum* large, showy, connate with petaloid lateral staminodes for at least half its length. *Stamen*: anther crest petaloid, often longer than parallel thecae. *Stigma* cup-shaped or two-lipped. *Epigynous glands* short, stub-like. *Ovary* trilocular with axile placentation.

Distributed from KwaZulu-Natal northwards to Ethiopia and the Nile lands and across the continent to Nigeria and the Gambia; also in equatorial West Africa. About 20 species have been described but the genus is badly in need of revision and the number is probably rather less. Two species are recorded from southern Africa.

Siphonochilus was raised partly on account of the unisexual flowers found in *Kaempferia natalensis*. This in itself is insufficient to warrant generic distinction but recent research has shown the separation of the African species from *Kaempferia* to be entirely justifiable. Spearing & Mahanty (1964) report that the African plants have a basic chromosome number of 14, that of Asiatic *Kaempferia* is 11. Morphologically, *Siphonochilus* differs in the absence of bracteoles, and in having lateral staminodes that are connate to the labellum for about half their length, non-ciliate rimmed stigma and stub-like rather than needle-shaped epigynous glands.

Key to species

- Flowers on an elongated peduncle 2. *S. kirkii*
- Flowers on very short peduncle concealed by basal bracts 1. *S. aethiopicus*

* Royal Botanic Garden, Edinburgh, UK.
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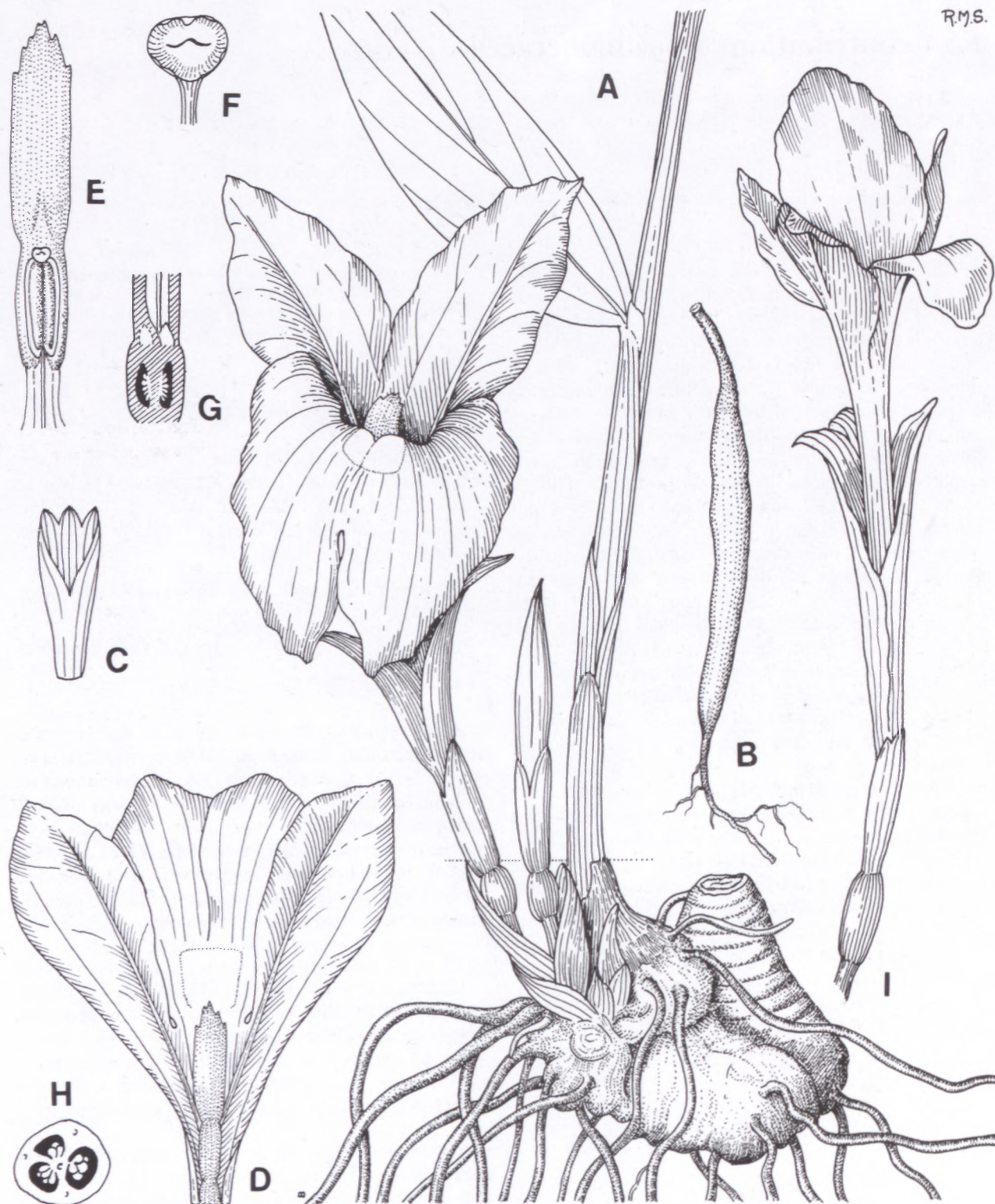


FIGURE 1.—*Siphonochilus aethiopicus*: A, habit, $\times 0.8$; B, root tuber, $\times 0.8$; C, calyx, $\times 0.8$; D, labellum and lateral staminodes spread out showing position of stamen, $\times 0.6$; E, stamen, $\times 1.2$; F, stigma, $\times 3.5$; G, l.s. of base of corolla tube and ovary, showing thickened walls of tube and epigynous glands, $\times 1.2$; H, ovary in t.s., $\times 2$; I, female flower, $\times 0.8$. A–H, from Hilliard & Burtt 6884A, Cult. R.B.G. Edinburgh; I, redrawn from Wood & Franks, t. 560.

1. *Siphonochilus aethiopicus* (Schweinf.) B.L. Burtt in Notes from the Royal Botanic Garden Edinburgh 40: 372 (1982); Lock: 20 (1985). Syntypes: Ethiopia; am Khor el Sherif und bei Famaka in Fesoghlu, 23-v-1848, Cienkowski; an der Gandua zwischen Wochni und Metemme, 9-vi-1862, Steudner; bei Wochni im nordwest Abyss., 31-v-1862, 3-vi-1862, Steudner (K!).

Cienkowskia aethiopica Schweinf.: t. 1 (1867).

Kaempferia aethiopica (Schweinf.) Benth.: 642 (1883).

K. ethelae J.M.Wood: 94, t. 34 (1898); Wright: 314 (1913); Marloth: 167 (1915). Type: Cult. B.G. Durban, xi-1897, Wood 7667 (NH), originally from Mozambique, Vila de Manica (Massikessi), Benningfield.

K. natalensis Schlecht. & K.Schum. in K.Schum.: 72, fig. 10e, f (1904); J.M.Wood & Franks: 112 (1911c); Wright: 315 (1913); Marloth: 167, t. 53 (1915). Type: KwaZulu-Natal, Inanda, comm. viii-1879, Wood 544 (K!).

Siphonochilus natalensis (Schlecht. & K.Schum.) J.M.Wood & Franks: t. 560, 561 (1911a); J.M.Wood & Franks: 274 (1911b); B.L. Burtt: 372, t. 1 (1982).

Cienkowskiella aethiopica (Schweinf.) Y.K.Kam: 10, t. 3 (1980).

Rhizome aromatic; fibrous roots bearing narrowly elongate tubers. *Leaf shoots* 300–1000 mm. *Leaves* 4–12, sessile, 300–400 × 50–90 mm (those at base of leaf shoot smaller), narrowly lanceolate, acuminate, glabrous; ligule 3–10 mm, membranous, entire; sheaths striate, glabrous. *Inflorescence* borne separately from leaf shoot, often precocious, basal part embedded in soil. *Flowers* 2–6, on a 10–20 mm bract-covered peduncle; floral bracts 25–30 × ± 15 mm, obtuse, glabrous; pedicels 10–20 mm long. *Hermaphrodite flowers*: calyx 20–30 mm, unilaterally split, shallowly 3-lobed, lobes rounded, sometimes with aristate point. *Corolla tube* white, 30–40 mm long, thick-walled. *Petals* white with pink tips, 60–80 mm long, lanceolate-acuminate. *Labellum*: purple-pink, yellow at throat in centre, free part ± 60–80 × 60–70 mm, bifid for up to $\frac{3}{4}$ of its length, lower part connate with lateral staminodes for 50–60 mm and encircling stamen ('split-tube' of Wood & Franks); lateral staminodes (the free part) 60–80 × 40–50 mm, erect. *Stamen* 50–80 mm; filament 10–15 mm; thecae 15–20 mm, parallel; connective prolonged into a 30–50 mm petaloid, irregularly dentate reflexed crest. *Stigma* more or less cup-shaped. *Epigynous glands* 3–4 mm, stub-shaped, often embedded in fleshy corolla wall. *Ovary* 15 × 6 mm, glabrous, trilobular with axile placentation. *Female flowers*: calyx, corolla tube and petals as above. *Lateral staminodes* and labellum connate into an 80 mm closed tube; segments 4–6, 2 or 3, alternate ones 40 × 20 mm, oblong obtuse, the other 2 or 3, 40 × 5–7 mm, narrower. *Stamen* absent. *Gynoecium* as in hermaphrodite flower. *Fruit* unknown. Figure 1.

The description of the female flower is taken from Wood & Franks (1911a).

Occurs in Northern Province, Mpumalanga, Swaziland and KwaZulu-Natal (Figure 2). Widespread throughout tropical Africa. It seems likely that the species never occurred naturally in the *Flora* area but that it was introduced from tropical Africa and widely cultivated (Williams *et al.* 1996). In 19th century Natal, *S. aethiopicus* was often dug up and the tubers sold as horse medicine; nowadays it is found only in the vicinity of Zulu dwellings, where it was presumably originally planted. In traditionally Zulu practice the plant is used in the treatment of colds and chest complaints, to ward off snakes and lightning, and as a remedy for malaria. It is known as the Natal Ginger, *Sherungulu*, *Indungulu*.

Vouchers: Hilliard & Burt 6884A (E); Holt, NH 28507 (NH); Medley Wood, NH 11250 (NH).

S. aethiopicus is a very polymorphic species, size, colour and depth of the lobing of the labellum may vary within a single population and considerable variation occurs in tuber length and in the size of the ligule.

The type plant of *Kaempferia natalensis* had only female flowers; Wood & Franks (1911a), when establishing *Siphonochilus*, recorded hermaphrodite flowers to be rare. In other respects the Natal plants cannot be separated from their more northerly counterparts.

2. *Siphonochilus kirkii* (Hook.f.) B.L.Burt in Notes from the Royal Botanic Garden Edinburgh 40: 372

(1982); Lock: 15, t. 4 (1985). Type: Tanzania, cult. at Kew, Kirk s.n. (K, holo.).

Cienkowskia kirkii Hook.f.: t. 5994 (1872).

Kaempferia kirkii (Hook.f.) Wittm. & Perring: 57, t. 1364 (1892); Baker: 294 (1898); K.Schum.: 68 (1904).

Cienkowskiella kirkii (Hook.f.) Y.K.Kam: 11 (1980).

K. rosea Baker: 295 (1898); F.W.Andrews: 255 (1956). Syntypes: Sudan, Schweinfurth 1946 (K, PRE!) and numerous other specimens from eastern Africa.

K. montagui F.M.Leight.: 57 (1932). Syntypes: Zimbabwe, nr Mazoe [= Mazowe], Montagu s.n. sub NBG888/21 (NBG); Wise s.n. sub NBG33/26 (NBG).

Roots bearing small fusiform tubers ± halfway along length. *Leaf shoots* 200–400 mm. *Leaves* 5–7, glabrous; lamina undeveloped in basal 1–3 or ovate to elliptic, acuminate, up to 170–310 × 55–100 mm, tapering at base into a false petiole up to 250 mm long (including leaf sheath); ligule obsolete; sheaths sulcate when dry. *Inflorescences* 1–4, borne separately from leaf shoot; 7–15(–20)-flowered; peduncle 200–350 mm long, terete, glabrous; bracts greenish, oblong to narrowly obovate, obtuse, the lower up to 65 × 20 mm, the upper very much smaller, up to 22 × 12 mm. *Flowers* hermaphrodite. *Calyx* campanulate, 8–15 mm long, shallowly 3-lobed, each lobe with a subterminal subulate projection ± 1 mm long. *Corolla tube* ± 8 mm long; petals narrowly obovate to narrowly oblong, acute, 22–26 mm long, whitish, tinged with green or mauve. *Labellum* 3-lobed, lateral lobes rhomboid, mauve, ± 30 × 20 mm, median lobe broadly spatulate, emarginate, ± 45 × 45 mm, mauve with a central yellow mark with or without a dark purple mark on each side. *Stamen* ± 25 mm long; thecae ± 5 mm long, curved; connective prolonged into oblong petaloid crest, ± 15 × 6 mm. *Ovary* ± 6 mm long, trigonous; stigma peltate. *Fruit* obovoid, trigonous, winged at angles, crowned with remains of calyx. *Seed* whitish, trigonous, ± 5.5 × 3.0 mm, with basal elaiosome.

Note: the above description is based on Lock (1985).

Occurs in the Caprivi Strip, Namibia (Figure 2). Widespread throughout tropical Africa.

Vouchers: Hardy 7110 (PRE); Killick & Leistner 3016 (PRE).

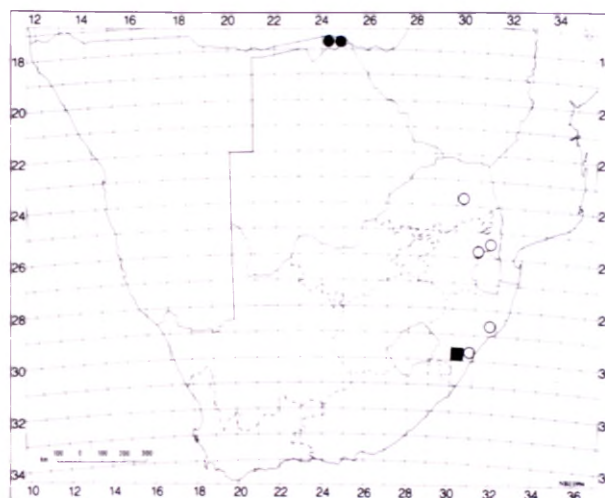


FIGURE 2—Distribution of *Siphonochilus aethiopicus*, ○, *S. kirkii*, ●, and *Hedychium coronarium*, ■.

2. *HEDYCHIUM* J.König

Hedychium J.König in Retz., *Observationes botanicae* 3: 73 (1783); Benth. & Hook.f.: 642 (1883); K.Schum.: 40 (1904). Type species: *H. coronarium* J.König.

Plants up to 3 m tall. *Inflorescence* terminal on a frond-like leaf shoot; bracts broad and imbricating and concealing main axis or narrow and enfolding flowers. *Flowers* 1–6 per bract, each subtended by a tubular bracteole. *Corolla* tube long, slender, usually exceeding calyx. *Petals* strap-shaped. *Labellum*: narrowed at base with a conspicuous, usually bilobed limb; lateral staminodes petaloid; filament usually long and slender; anther connective ecristate. *Ovary* trilocular with axile placentation. *Fruit* globose or oblong, often bright red or orange within.

About 45 species, mainly eastern Himalayan, but a few known from southern India, Thailand, Malaysia and Indonesia. Several are widely cultivated throughout tropical and subtropical zones and are valued for their perfume and prolific flowers.

Key to species

- 1a Bracts broad and imbricating, concealing main axis; petaloid parts white or yellow; filament white or yellow:
 - 2a Flowers yellow; stamen longer than labellum 2. *H. flavescens*
 - 2b Flowers pure white, base of labellum usually yellow-green; stamen shorter than labellum 1. *H. coronarium*
- 1b Bracts narrow, not concealing main axis; petaloid parts yellow; filament bright red 3. *H. gardnerianum*

1. **Hedychium coronarium** J.König in Retz., *Observationes botanicae* 3: 73 (1783); Sims: t. 708 (1804); K.Schum.: 44 (1904). Type: Malaya, König s.n. (†).

Plant up to 3 m. *Leaves* sessile, up to 600 × 110 mm, lanceolate-acuminate, glabrous with a few silky hairs on and near midrib on abaxial surface; ligule papyraceous, white or brown, up to 30 mm high. *Inflorescence* up to 200 × 110 mm; bracts 40–60 × 20–30 mm, ovate-obtuse, subcoriaceous, green, overlapping, each subtending 2–6 flowers. *Flowers* white, intensely fragrant. *Calyx* tubular, unilaterally split, glabrous, hidden by bract. *Corolla* tube up to 70 mm; petals 3, linear-lanceolate, equal, declined. *Staminodes*: 30–50 mm, oblong-lanceolate; labellum ± 35 × 50 mm, usually yellow-green in centre, deeply 2-lobed. *Stamen* white, shorter than labellum; anther 12 mm long. *Ovary* glabrous, or slightly to densely hairy at flowering stage, 5 mm long. *Fruit* a capsule; seeds rounded, greyish, ± 5 mm long.

Note: the above description is partly based on Smith (1984), partly on Turrill (1914) and partly on new observations.

Vouchers: *Rhind* s.n. (PRE); *Schlieben & Mendelsohn* 12618 (cultivated) (PRE).

H. coronarium is widely cultivated in the tropics and subtropics. It has become naturalised in the Pietermaritzburg area (Figure 2), the seeds being dispersed by birds.

2. **Hedychium flavescens** Roscoe, Monandrian plants of the order Scitameneae: t. 50 (1825); Lourteig: 123 (1972). Type: Roscoe, Monandr. t. 50.

Plants 2–3 m high. *Leaves* sessile, up to 600 × 80 mm, lanceolate-acuminate, lightly pubescent below; ligule 10–20 mm, entire, pubescent. *Inflorescence* up to 200 × 80 mm; bracts 50 × 35 mm, broadly ovate, rather obtuse, membranous at margins, unevenly pubescent. *Flowers* yellow. *Calyx* up to 45 mm, pubescent, unilaterally split. *Corolla* tube ± twice length of calyx. *Petals* linear, ± 40 × 20 mm. *Labellum*: broadly obcordate, narrowed at base, bilobed above, 80 × 25 mm at broadest part; lateral staminodes 25–30 mm, spatulate. *Stamen* up to 40 mm long. *Ovary* silky pubescent. *Fruit* ?

H. flavescens is native to the eastern Himalayas. As a garden escape it has become naturalised in many countries and has been found in the Pietermaritzburg area.

3. **Hedychium gardnerianum** Ker Gawl. in Botanical Register 9: t. 774 (1 Feb. 1824); Roscoe: t. 62 (before 21 April 1824). Type: Hort. Liverpool, Sheppard.

Plants 2–3 m high. *Leaves* shortly petiolate, 240–400 × 100–150 mm, lanceolate-acuminate, glabrous; ligule 20–40 mm entire. *Inflorescence* up to 350 mm long; bracts 30–50 mm, convolute, remote. *Flowers* yellow. *Corolla* tube ± 50 mm long. *Petals* linear. *Labellum*: 25–30 × 10–20 mm, obovate, emarginate; lateral staminodes 30–35 mm long, narrowly oblanceolate; filament bright red. *Fruit* red within.

This very handsome species is also a native of the eastern Himalayas. The sweetly scented inflorescence is the largest found in *Hedychium*. It is naturalised around Kloof, inland from Durban.

3. ALPINIA Roxb.

Alpinia Roxb. in Asiatic Researches 11: 350 (1810) nom. cons.; Benth. & Hook.f.: 648 (1883); K.Schum.: 308 (1904). Type species: *A. galanga* (L.) Willd.

Catimbium Lestib.: 346 (1841), non Juss. (1789).

Languas Small: 307 (1913).

Plants up to 120 mm tall, more usually 2–4 m. *Inflorescence* terminal on a frond-like leaf shoot. *Flowers* borne singly or in cincinni; bracts and/or bracteoles present or not. *Labellum*: often showy, lateral staminodes present as small subulate teeth or reduced to small swellings or absent; anther connective crested or not. *Fruit* usually spherical.

A large genus of at least 200 species widely distributed throughout SE Asia with representatives in Queensland and Japan.

1. **Alpinia zerumbet** (Pers.) B.L.Burtt & R.M.Sm. in Notes from the Royal Botanic Garden Edinburgh 31: 204, t. 10 (1972). Type: Wendland, t. 19 (1798).

Costus zerumbet Pers.: 3 (1805).

Zerumbet speciosum Wendl.: 3, t. 19 (1798).

Alpinia speciosa (Wendl.) K.Schum.: 334 (1904), non (Bl.) D.Dietr.: 13 (1839).

Catimbium speciosum (Wendl.) Holtt.: 152 (1950).

Plants up to 3 m. *Leaves* sessile or shortly petiolate, up to 600 × 100 mm, lanceolate acuminate, margins pubescent, undersurface sometimes so; ligule pubescent. *Inflorescence* pendulous, up to 300 mm long, axis pubescent. *Flowers* white red and yellow, borne in 2-flowered cincinni; bracts absent; bracteoles glistening white with pink tips, open to base but encircling flower buds, quickly deciduous. *Corolla tube* shorter than 20 mm calyx. *Petals* white, dorsal much broader than laterals. *Staminodes*: labellum up to 40 mm long, broadly ovate, bifid at apex, yellow, mottled and striped with red; lateral staminodes slender, subulate, up to 10 mm long; anther massive, ecristate. *Ovary* densely pubescent. *Fruit* spherical, up to 20 mm diam., orange.

A. zerumbet, the Shell Ginger, is found in tropical gardens all over the world. It is probably truly native to NE India, Burma and Indo-China. It is reported to have escaped from gardens in the Hluhluwe area of Zululand.

Excluded species

Kaempferia stenopetala K.Schum. in Das Pflanzenreich Heft 20 Zing. 69 (1904); Wright: 314 (1913).

This name was based on an unlocalised collection from Natal (*Medley Wood* 1942, K!). It is almost certainly the Asiatic *K. rotunda* L. widely cultivated in the east for its medicinal properties, and presumably brought to Africa by the Indians.

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