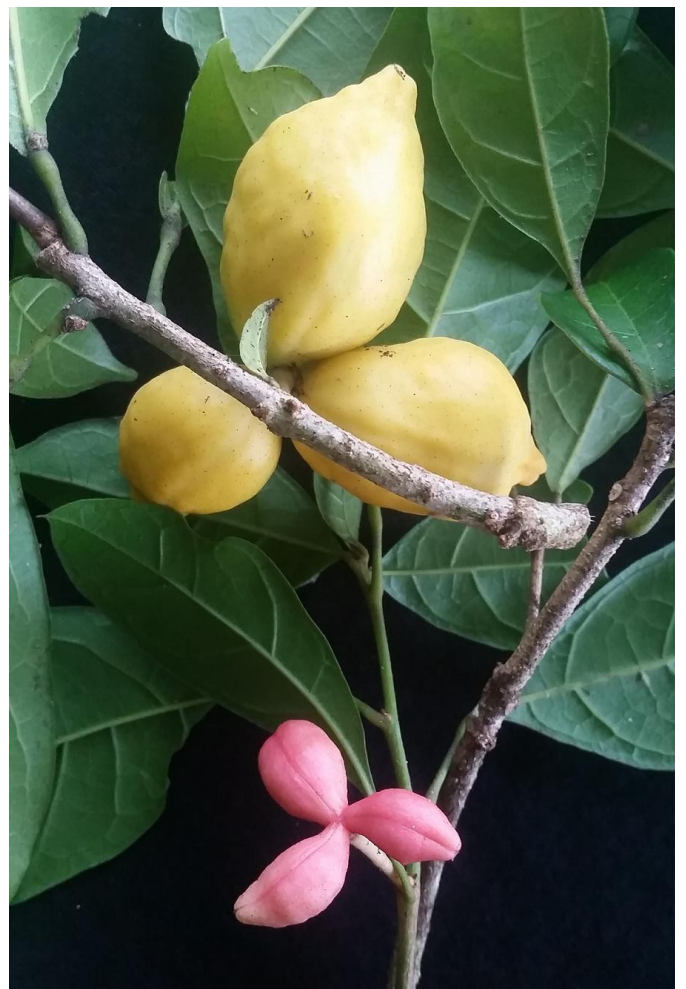
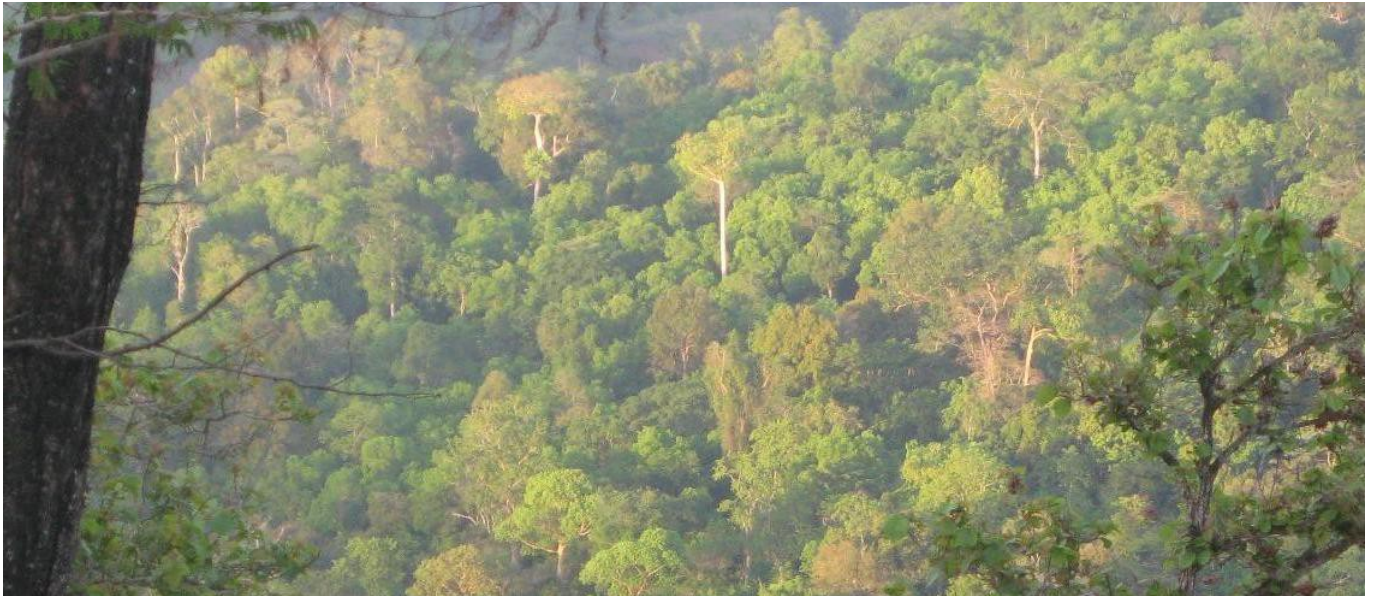


# Endemic plant species of Kimboza Forest Reserve



Since the current investigation were initiated in 2017 a number of endemic species have been located in the field. In addition, potential new species of *Cola*, *Dorstenia* and *Drypethes* have also been found.

The status of the following taxa is now fairly well known:

Species	Family	Status
<i>Coffea kimbozensis</i> Bridson	Rubiaceae	Only a few individuals have been located in just one area of the forest. Rare and failing to regenerate.
<i>Cola kimbozensis</i> Cheek	Sterculiaceae	It is fairly common in one part of Kimboza.
<i>Cola quentinii</i> Cheek	Sterculiaceae	Common and even dominant in one part of Kimboza. It also occurs sparingly around Kimboza.
<i>Impatiens cinnabarina</i> Grey-Wilson	Balsaminaceae	Very locally common in some rocky areas.
<i>Mwasumbia alba</i> Couvreur & D.M. Johnson	Annonaceae	A few individuals restricted to one small sarea of Kimboza.
<i>Pavetta crebrifolia</i> Hiern var. <i>kimbozensis</i> (Bremek.) Bridson	Rubiaceae	This shrub is uncommon inside and around Kimboza.
<i>Solanum ruvu</i> Voronts.	Solanaceae	Re-discovered in 2020 but is rare as only 10 individuals have been located on just two rock outcrops.
<i>Thunbergia</i> sp. nov 'kimboza'?	Acanthaceae	Rare as just two observations have been made inside Kimboza and in a forest remnant to the NE of the reserve.
<i>Turraea kimbozensis</i> Cheek	Meliaceae	This shrub is fairly common in the shrub layer under least disturbed forest.
<i>Uvariadendron kimbozaense</i> Dagallier & Couvreur	Annonaceae	Rare and only collected three times.

The following taxa have yet to be traced in the field:

<i>Baphia pauloi</i> Brummitt	Fabaceae - Papilionoideae
<i>Chassalia discolor</i> Schumann subsp. <i>grandiflora</i> Verdc.	Rubiaceae
<i>Diphasia morogoroensis</i> Kokwaro var. <i>subalata</i> Kokwaro	Rutaceae
<i>Drypetes usambarica</i> (Pax) Hutch.	Euphorbiaceae
<i>Garcinia bifasciculata</i> N. Robson	Clusiaceae
<i>Isoglossa asystasioides</i> I.Darbysh.	Acanthaceae
<i>Lingelsheimia sylvestris</i> (Radcl.-Sm.) Radcl.-Sm.	Euphorbiaceae
<i>Necepsia castaneifolia</i> subsp. <i>kimbozensis</i> (Radcliffe-Smith) Bouchat & J. Léonard	Euphorbiaceae
<i>Streptocarpus kimbozanus</i> B.L. Burt	Gesneriaceae
<i>Vitex morogoroensis</i> Walsingham & S. Atkins	Verbenaceae

Status global: **Endangered** Status local: **Endangered**

Endemic species collected only once since its discovery in 1953!  
Probably Critically Endangered.

**Striking identification features**

- small showy flowers



**Description**

*Stature:* small tree.

*Size:* -

*Bark:* -

*Leaves:* simple and alternate (up to 6cm long and 3cm wide).

*Flower:* 2-7 small flowers (ca. 1cm) on short axillary racemes.

*Fruit:* pods have never been collected.

*Seed:* unknown.



Isotype held at the Lushoto Herbarium

**Status and distribution:** Endemic to Kimboza. Described as Endangered but is probably Critically Endangered as it has only been collected once since its discovery despite substantial collecting efforts.

**Habitat requirements:** Unknown.

**Phenology:** flowers in November.

**Reproduction:** -

**Locals uses:** None are known.

**Sources and further information**

*Botanical description:* Brummitt (1968), Gillett *et al.* (1971)

*Herbarium specimens:*

Paulo 164 (K, EA, Lushoto)

DSM 2470 (DSM)

Brummitt, R.K. (1968) The genus *Baphia* (Leguminosae) in East and North-East tropical Africa. Kew Bull. 22, 513-536.

Gillett, J.B., Polhill, R.M. & Verdcourt, B. (1971) Leguminosae Part 4; Papilionoideae (1) & (2). In Milne-Redhead, E. & Polhill, R.M. (Eds) Flora of Tropical East Africa, Crown Agents for Overseas Governments and Administrations, London.

***Chassalia discolor* Schumann subsp. *grandiflora* Verdc.**

Rubiaceae

**Mguhu**

Status global: **Restricted** Status local: **Restricted**

This sub-species of woody herb is restricted to the slopes near the Ruvu River.

**Striking identification features**

- woody herb
- purple or purple and white flowers
- two-lobed small fruits



**Description**

*Stature:* woody herb.

*Size:* 1-4(-6) m tall.

*Bark:* finely ridged glabrous stems.

*Leaves:* opposite, simple (5-14 x 2.5-6 cm).

*Flower:* purple or purple and white flowers on small inflorescences.

Scented.

*Fruit:* white, reddish or purple-black, round or two-lobed (5-6 mm long).

*Seed:* ± 5 mm wide.



**Status and distribution:** An East African species with a number of sub-species including one restricted to Kimboza.

**Habitat requirements:** Specimens collected close to the Ruvu River at an altitude of around 300 m.

**Phenology:** Recorded as flowering in October.

**Reproduction:** Visited by bees.

**Uses in East Africa:** In Tanzania it is used as firewood, shade and amenity plant.

**Locals uses:** None are known.

**Sources and further information**

*Botanical description:* Verdcourt (1975)

*Herbarium specimens:*

Pocs T & S, 6274D (EA) 1970-10-25, type

Pocs & Gibbon 6060/D (EA) 1969-11-19

Amri 092 (DSM) 2002

Verdcourt, B. (1975) Studies in the Rubiaceae: Rubioideae for the 'Flora of Tropical East Africa'. I. Kew Bull. 30, 247-326.

Status global: **Critically Endangered** Status local: **Critically Endangered**

This Critically Endangered shrub is known from 4 collections. The type specimen was collected near the mission on limestone outcrops.

**Striking identification features**

- small orange fruits at base of leaf
- opposite leaves
- stipule and domatia



**Description**

*Stature:* shrub.

*Size:* 3-7 m tall.

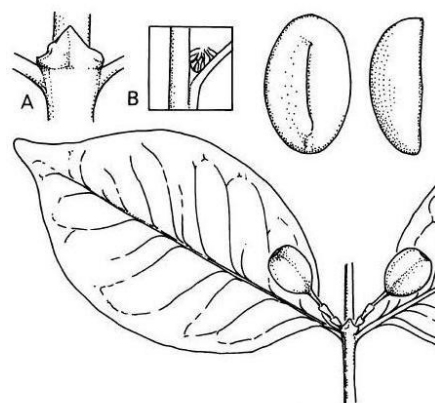
*Bark:* mid-brown.

*Leaves:* opposite, dark green, glossy and leathery (7.5-13.5 x 3.5-6.5 cm).

*Flower:* not known but now photographed (left by C.J. Kilawe).

*Fruit:* orange (up to 1.5 x 1 cm) at base of leaf.

*Seed:* immature seeds, olive green.



(source: Bridson, 1994)

Note stipule (A) and domatium (B)

**Status and distribution:** Endemic to Kimboza and assessed as Critically Endangered. Type collected at 450m near the Kibungo Mission.

**Habitat requirements:** Found in forest type composed of *Milicia excelsa*, *Rhodognaphalon schumannianum* and *Terminalia sambesiaca* as dominant on crystalline limestone outcrops.

**Phenology:** Young fruits in February and April, and mature in July.

**Reproduction:** Bird-dispersed.

**Uses in East Africa:** None are known.

**Locals uses:** None are known.

**Sources and further information**

*Botanical description:* Bridson (1994)

*Herbarium specimen:* Bidgood, S., Mwasumbi, L. & Vollesen, K. 1246 (K, BR, DSM, EA, MO, NHT, WAG) type, 1988-04-21, fr

Rodgers *et al.* 2511 (DSM, K), 1983-07

Mwasumbi *et al.* 12393 (DSM, K)

Mvungi 8 (DSM, EA, K, NHS), 2002-02-26 green fr

*Field record:*

Kilawe 2020-09-01, fl.

Bridson, D.M. (1994) Additional notes on *Coffea* (Rubiaceae) from Tropical East Africa. Kew Bull. 49, 331-342.



Status global: **Endemic (CR)** Status local: **Locally common endemic**

Small evergreen tree endemic to Kimboza and reported to be locally common in areas with permanent streams.

**Striking identification features**

- inflated leaf stalk at base of lamina
- large and distinct fruits with 4 follicles (banana-like)
- small flowers on woody burrs



Flowers (source Rodgers *et al.* 2624)

**Description**

*Stature:* small tree.

*Size:* 4-7 m tall.

*Bark:*

*Leaves:* simple (9-16 cm long x 4-7 cm wide) and leathery with 5-6 lateral nerves on either side of the mid-rib. Leaf stalk inflated (pulvinus) at the base of lamina and at angle.

*Flowers:* many small (3 mm in diam) cream-coloured flowers on woody burrs on leafless twigs (0.5-2 cm long).

*Fruits:* large fruit with 4 follicles (banana-like carpels) green turning yellow when mature.

*Seeds:* -



© Pierre Binggeli

The first record of a fruit (immature) of *Cola kimbozensis* (determined by Martin Cheek – Kew).

**Status and distribution:** *Cola kimbozensis* is restricted to Kimboza Forest and was reported as locally common in 1983. A small population was found in early 2019. As the forest is threatened by recurrent fires and the spread of the invasive *Cedrela odorata* the species has been assessed as Critically Endangered.

**Habitat requirements:** The species appears to be common but restricted to areas with permanent streams and more particularly in areas with young *Pandanus rabaiensis* and semi-open canopies. This in turn favours the spread of *Cedrela odorata* which dominates the canopy of the identified population of *C. kimbozensis*.

**Phenology:** Flowering in October and unripe fruits observed in December, but ripening by middle of month.

**Reproduction:** Probably dispersed by monkeys.

**Locals uses:** None are known.



**Sources and further information**

*Botanical description:* Cheek & Dorr (2007)

*Herbarium specimen:* Rodgers, Hall & Mwasumbi 2624 (K,DSM,MO), 1983-10

Binggeli *et al.* 2019-12-08

*Field records:*

Kilawe 2020-08-30, fl.

Binggeli *et al.* 2022-12-07, fl.

Cheek, M. & Dorr, L. (2007) Sterculiaceae. In Beentje, H.J. & Ghazanfar, S.A. (Eds) Flora of tropical East Africa. Kew Publishing, Royal Botanic Gardens, Kew.

Status global: **Endemic (CR)** Status local: **Common**

A shrub or small tree endemic to Kimboza and two other locations. It is locally common in unburnt and *Cedrela* free forest.

**Striking identification features**

- often multi-stemmed
- large leaves with basal pulvinus
- red-purple/yellow flowers on stems
- fruit with up to 5 follicles



**Description**

*Stature:* shrub or small tree, often multi-stemmed.

*Size:* to 6(-15) m tall.

*Bark:*

*Leaves:* large, but variable in size (14-52 × 7.5-27 cm), dark green leaves, petiole (0.9-27 cm long), basal pulvinus (3-8 mm wide).

*Flower:* unisexual occurring on the same individual on 1-4-flowered woody burrs of the main stem or branches. Flowers (ca 2 cm across) on short stalks are red-purple with yellow anthers or yellow stigmas.

*Fruit:* large fruit (6.5-8.5 cm across) consisting of up to 5 roundish follicles.

*Seed:*

*Left:* As a result of the 2021 drought there was a lot of foliage dieback in many trees but affected the lower leaves only. *Inset:* multi-stemmed individual which may arise which may arise as regrowth after fire. *Right:* male (top) and female (bottom) flowers.



**Status and distribution:** This species is endemic to the Uluguru mountains and found at only three sites, including Kimboza. It has been assessed as Critically Endangered.

**Habitat requirements:** In Kimboza it is locally dominant in the shrub layer of steepish slopes on shallow soils. Much of its habitat has been burnt by fires spreading from outside the reserve. These burnt areas form a mosaic with 'intact' forest and are dominated by the invasive *Cedrela odorata*. *Cola quentinii* has not been observed to recolonize these near monotypic young stands *Cedrela*.

**Phenology:** Observed to flower in September to early November and fruits in December.

**Reproduction:** Flowers of separate sexes on the same individuals.

**Uses in East Africa:** None are known.

**Locals uses:** None are known.



**Sources and further information**

*Botanical description:* Cheek & Dorr (2007) *Herbarium specimens:*

Luke 772 (EA,K,NHT,BR), 1987-11-04, fl  
Luke *et al.* 7624 (EA,K,NHT,BR), 2001-09-19, fl, type

Cheek, M. & Dorr, L. (2007) Sterculiaceae. In Beentje, H.J. & Ghazanfar, S.A. (Eds) Flora of tropical East Africa. Kew Publishing, Royal Botanic Gardens, Kew.

*Left:* the first ever collection of the fruit.

## *Diphasia morogoroensis* Kokwaro

Rutaceae

- var. *subalata* Kokwaro

Status global: **Restricted** Status local: **Restricted**

Evergreen shrub that is restricted to the Morogoro region with a distinct variety at Kimboza. Little is known about the plant.

### Striking identification features

- trifoliolate leaf
- winged petiole



### Description

*Stature:* evergreen shrub.

*Size:* to 1-3 m high.

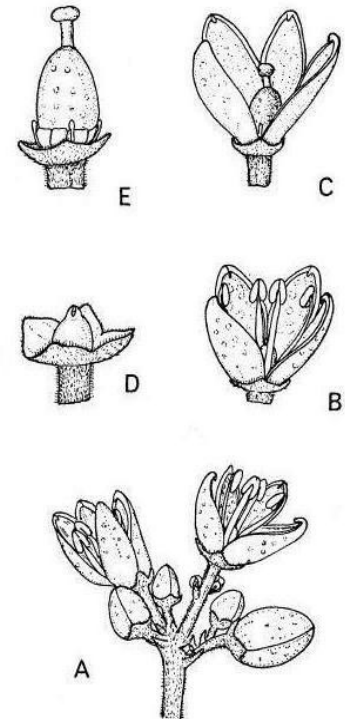
*Bark:*

*Leaves:* trifoliolate, each foliole is 11-22 x 4-7-5 cm. The Kimboza variety has a slightly winged petiole.

*Flower:* axillary inflorescences. Flowers are either male, female or hermaphrodite.

*Fruit:* 12-15 mm long and 1 cm in diameter.

*Seed:*



Petiole of the Kimboza variety, var. *subalata*, is shown at bottom.

A. male inflorescence. B. male flower, C. female flower, D. male flower with petals removed, E. female flower with petals removed.

**Status and distribution:** The only species of this genus in eastern Africa and found in the Nguru and Uluguru mountains and drier forests to the East. Two varieties and one of which, var. *subalata*, is restricted to Kimboza Forest.

**Habitat requirements:** Appear to be restricted to riverine forest on limestone outcrops.

**Phenology:** -

**Reproduction:** -

**Uses in East Africa:** None are known.

**Locals uses:** None are known.

### Sources and further information

*Botanical description:* Kokwaro (1978)

*Herbarium specimens:*

Kabuye 267 (EA, holotype of variety), 1970-07-04

Kokwaro, J.O. (1978) New taxa and combinations in Rutaceae of E. and NE. Africa. Kew Bull. 32, 785-798.



## *Drypetes usambarica* (Pax) Hutch.

## Euphorbiaceae

**Nyachititu?** - var. *stylosa* Radcl.-Sm.

Status global: probably **restricted** Status local: **Present**

Large East African canopy tree present in Kimboza that may turn out to be the same taxa as one of the other two occurring *Drypetes* spp.

### Striking identification features

- fluted trunk with knobs often bearing flowers and fruits
- alternate, asymmetrical, dark green, stiff and leathery leaves



### Description

**Stature:** large tree with straight and fluted trunk.

**Size:** to 60 m.

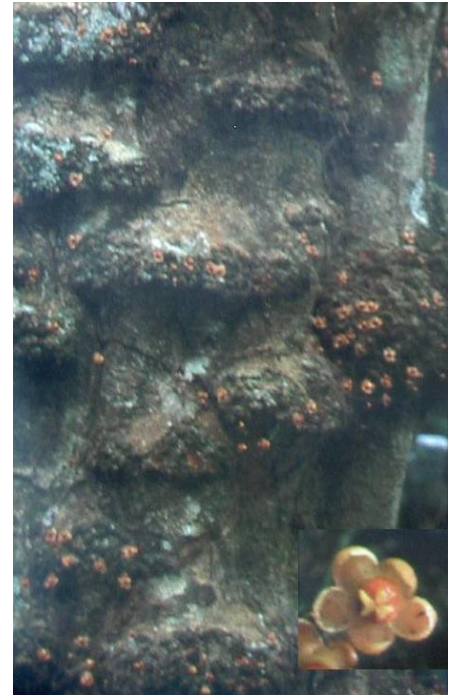
**Bark:** grey/ brown and smooth with knobs on the trunk.

**Leaves:** alternate, simple and asymmetrical (lamina 4-15 x 1.5-6.5 cm). dark green, stiff and leathery.

**Flower:** small, yellow-green on bosses on the trunk. Stalk 1-3 cm long.

**Fruit:** green-brown-orange, ovoid drupe (2 x 1.5 cm).

**Seed:**



**Status and distribution:** Four varieties of *D. usambarica* have been recognized including var. *stylosa* which is endemic to Kimboza Forest. In addition, specimens identified as *D. natalensis* (Harvey) Hutch. and *D. parvifolia* (Well. Arc.) Pax & Hoffm have also been collected. The latter species is a small tree (to 6 m high) with axillary or solitary flowers. Radcliffe-Smith (1995) has suggested that *D. natalensis* and *D. usambarica* might be a single very polymorphic species.

**Habitat requirements:** It occurs near the Kibungo Mission on crystalline limestone outcrops. No further information is available for Kimboza.

**Phenology:** Observed to flower in April.

**Reproduction:** The species is dioecious. However, an East African observation indicate that male and female flowers can occur on different parts of the same tree.

**Uses in East Africa:** The tree is used for shade and bee forage. Its wood is hard and used for firewood, charcoal, pestles, mortars, poles, tool handles and wooden spoons.

**Locals uses:** None are known.

### Sources and further information

**Botanical description:** Lovett *et al.* (2006)

**Herbarium specimens:**

Bidgood *et al.* 1247 (holotype K; isotypes C, DSM, EA, MO, NHT, WAG), 1988-04-21 Pocs 6054D

*Drypetes natalensis* (Harvey) Hutch. DSM 2670

*Drypetes parvifolia* (Well. Arc.) Pax & Hoffm. Mwasumbi 12444, 1988-04

Lovett, J.C., Ruffo, C.K., Gereau, R.E., Taplin, J., Sørensen, L. & Lovett, J. (2006) Field guide to the moist forest trees of Tanzania. CELP, Frontier-Tanzania and CEPF.

Radcliffe-Smith, A. (1990) Notes on African Euphorbiaceae: XXIV: *Drypetes* (ii). Kew Bull. 45, 671-675.

Radcliffe-Smith, A. (1995) Additions and corrections to 'Euphorbiaceae' for 'Flora of Tropical East Africa'. Kew Bull. 50, 809-816.

Schulman, L., Junikka, L., Mndolwa, A. & Rajabu, I. (1998) Trees of Amani Nature Reserve, NE Tanzania. The Ministry of Natural Resources and Tourism, Tanzania.

## *Garcinia bifasciculata* N. Robson

Clusiaceae

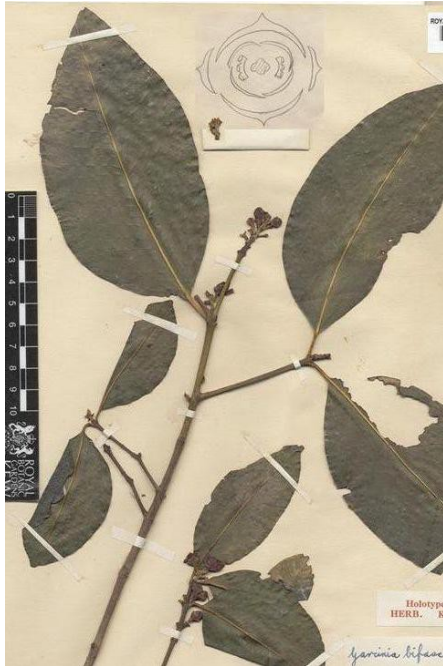
**Mbogole, (Mtonga mweusi)** (also refer to two other *Garcinia* species)

Status global: **Endangered (E)** Status local: **Endangered**

**Striking identification features**

- much branched

Only five collections of this small tree have ever been made from in and around Kimboza forest.



### Description

*Stature:* small much branched tree.

*Size:* 4.5-6 m tall.

*Bark:*

*Leaves:* opposite, entire (to 12 x 7 cm).

*Flower:* small greenish white flowers (< 0.5 cm).

*Fruit:* not known.

*Seed:* not known.

**Status and distribution:** Endemic to the Kimboza area. The type specimen was collected from near Kimboza on the Mikese-Kisaki road (1300ft (390 m) asl). The only four other collected samples are from Kimboza forest. Assessed as Endangered in 1998.

**Habitat requirements:** Greenway collected the specimen in rain-swamp forest in a black soil on a limestone formation. He described it as not common.

**Phenology:** Recorded as flowering in April and July.

**Reproduction:**

**Uses in East Africa:** None are known.

**Locals uses:** None are known.

### Sources and further information

*Botanical description:* Exell & Robson (1960), Bamps *et al.* (1978)

*Herbarium specimens:*

Greenway 2524 (EA,K,MO,NHT), 1930-09-04, fl.

Semsei 811 (EA,K,MO), 1952-07 fl.

Semsei 825 (EA,K), 1952-07 fl.

Mwasumbi *et al.* 12344 (DSM,MO,NHT), 1983-04

Luke & Luke 7649 (MO,NHT), 2001-09-19

Bamps, P., Robson, N. & Verdcourt, B. (1978) Guttiferae. Flora of Tropical East Africa. Crown Agents for Overseas Governments and Administrations.

Exell, A.W. & Robson, N.K.B. (1960) New species of *Polygala* and *Garcinia* from tropical Africa. Boletim da Sociedade Broteriana 34, 93-98.

## *Impatiens cinnabarina* Grey-Wilson

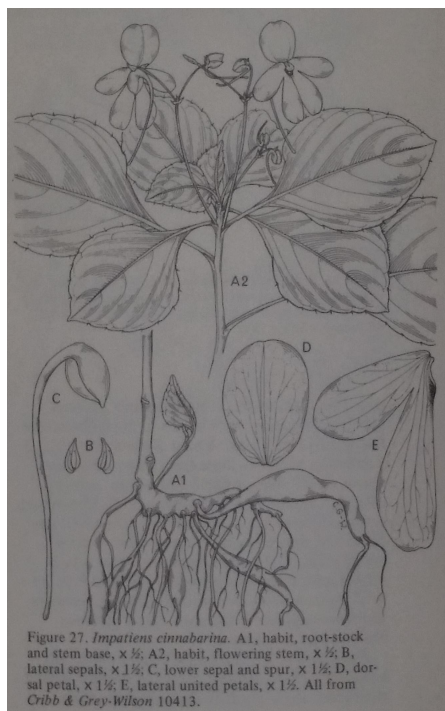
## Balsaminaceae

Status global: **Endemic** Status local: **Endemic but locally common**

Erect endemic herb with showy flowers restricted to crevices of crystalline limestone. Common only in a few small areas.

### Striking identification features

- deep coral-red flowers
- erect herb
- fleshy underground tuber
- small explosive fruits



### Description

**Stature:** erect herb with a fleshy stem, often moderately branched, arising from a fleshy underground tuber (1-1.5 cm in diam).

**Size:** to about 70 cm tall

**Bark:** -

**Leaves:** spirally arranged and crowded at the top of the stems. Velvety green above, pale green beneath.

**Flower:** deep coral-red. 2-5 flowers on axillary inflorescences.

**Fruit:** small explosive fruits.

**Seed:** very small.



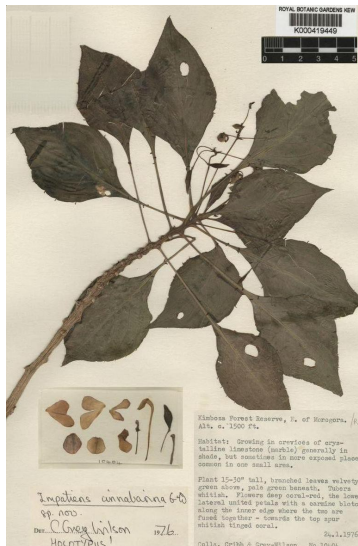
**Status and distribution:** First collected in 1976 and described in 1979. This species is endemic to Kimboza Forest. Common only in a few small areas.

**Habitat requirements:** Grows in crevices of crystalline limestone (marble) generally in shade, but sometimes found in more exposed places. In 1976 said to be common in one small area. The tuberous root system provides some resistance to drought conditions.

**Phenology:** Recorded flowering in January, February, April and December.

**Reproduction:** Insect pollinated with an explosive seed dispersal mechanism.

**Locals uses:** None are known.



### Sources and further information

**Botanical description:** Grey-Wilson (1979, 1980)

**Herbarium specimens:**

Cribb & Grey-Wilson 10404 (K,EA), 1976-01-24, type

Cribb & Grey-Wilson 10413 (K,EA)

Mwasumbi 12421 (k,dsm), 1983-04

Grey-Wilson, C. (1979) New taxa in African *Impatiens* (Balsaminaceae). Kew Bull. 33, 641-649.

Grey-Wilson, C. (1980) *Impatiens* of Africa. Balkema.

Left, type specimen collected in 1976.

## *Isoglossa asystasioides* I.Darbysh.

Acanthaceae

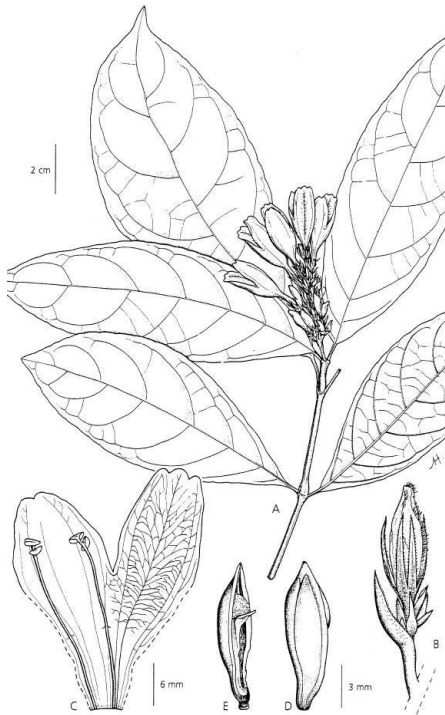
### Mhande

Status global: **Restricted** Status local: **Endemic** and **Endangered**

An endemic subshrub probably now only found in Kimboza Forest. It was said to be locally common in swamp forest in 1952.

### Striking identification features

- orange-brown tubular flowers (to 3 cm) with just 2 stamens
- fruit: 2-seeded capsule (1 cm)



A habit; B unopen flower, C. dissected corolla, inner surface with attached two stamens, D capsule, outer surface, and E capsule valve with immature seed.

### Description

*Stature:* subshrub.

*Size:* 50-200 cm tall.

*Bark:*

*Leaves:* opposite, simple (10-19 x 3-7 cm).

*Flower:* terminal inflorescence (spike, 1.5-5.5 cm long), orange-brown tubular flowers variable in size (to 3 cm) and this may be due to rapid maturation.

*Fruit:* capsule (10 x 3 mm) that is two-seeded (unlike other spp in genus and thus needs to be confirmed through further collections).

*Seed:* only immature seeds collected.



**Status and distribution:** This species is restricted to Tanzania and has been collected just six times, of which 5 collections are from Kimboza. First discovered in 1952 and recorded as locally common, but it was only recognized as a new species in 2007. It has been assessed as Endangered. Due to habitat loss in the region the species may now only exist in Kimboza. The only location outside Kimboza, where it was collected, was on the road 25 miles from Morogoro in 1966.

**Habitat requirements:** In Kimboza it is found in swamp forest in the undergrowth, typically on karstic limestone with shallow soils. It appears to be restricted to the lower part of Kimboza, i.e. between 220 and 350 m asl.

**Phenology:** Flowering recorded in April, July, and September. Fruiting recorded in July.

**Reproduction:**

**Uses in East Africa:** None are known.

**Locals uses:** None are known.

### Sources and further information

*Botanical description:* Darbyshire & Ensermu Kelbessa (2007)

*Herbarium specimens:*

Semsei 814 (K), 1952-07, fl & fr

Semsei 821 (EA,K), 1952-07, fl & fr

Mwasumbi *et al.* 12438 (DSM,K), 1983-04-01, fl

Rodgers *et al.* 2512 (DSM,K), 1983-07, type fl & fr

Mwasumbi *et al.* 2578 (DSM,K), 1983-07, in bud

Luke *et al.* 7631 (EA,K,NHT,BR), 2001-09-19, fl 220 m asl

Darbyshire, I. & Ensermu Kelbessa (2007)

*Isoglossa asystasioides*: a striking new species of Acanthaceae from Tanzania. Kew Bull. 62, 617-621.

***Lingelsheimia sylvestris* (Radcl.-Sm.) Radcl.-Sm.**

Euphorbiaceae

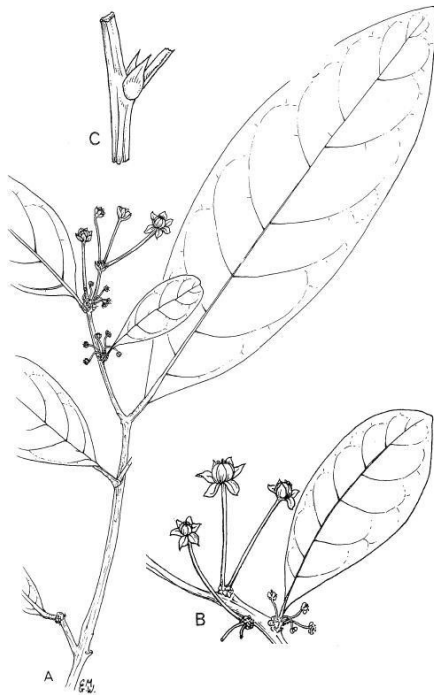
- *Aerisilvaea sylvestris* Radcl.-Sm.

Status global: **Endangered (EN)** Status local: **Endangered**

An endemic small woody plant that is restricted to moist areas of Kimboza.

**Striking identification features**

- large simple leaves to 20cm long
- male and female flowers on same shoot
- 3-seeded fruit



**Description**

*Stature:* shrub/small tree.

*Size:* to 4 m high.

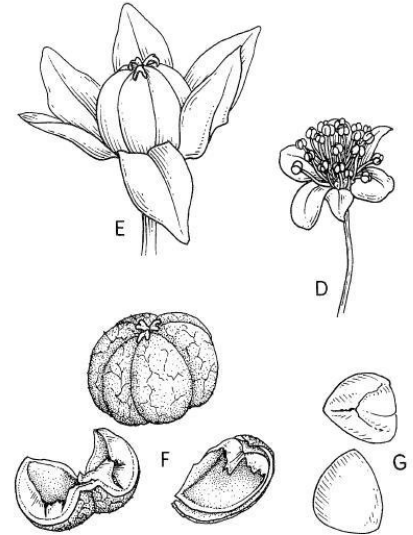
*Bark:*

*Leaves:* alternate, large, up to 20cm long.

*Flower:* small flowers on axillary inflorescences. Monoecious, with male (17-20 stamens) and female flowers occurring on the same shoot.

*Fruit:* 3-seeded fruit.

*Seed:*



A. flowering branch, B. flowering nodes, C. stipules, D. male flower, E. female flower, F. fruit and mericarps, G. seeds (ventral and dorsal faces)

**Status and distribution:** This species is the only member of the genus. It is restricted to Kimboza Forest and is confined to an area no greater than 0.1 km<sup>2</sup>. Discovered in 1987 and described in 1990. In 1998 it was assessed as Endangered.

**Habitat requirements:** This shrub appears to be restricted to swampy areas with permanent rivulets and dominated by *Pandanus rabaiensis*.

**Phenology:** With flowers and fruits in November.

**Reproduction:**

**Uses in East Africa:** None are known.

**Locals uses:** None are known.

**Sources and further information**

*Botanical description:* Radcliffe-Smith & Harley (1990)

*Herbarium specimens:*

Luke 754 (K, BR, DSM, EA, MO, US) 1987-11-04, fr, type

Luke 7644 (k, ea, MO), 2001-09-19

Luke & Luke 8799 (BR, K, DSM, EA, MO, US) 2002-06-13

Kayombo 5327 (MO), 2006-03-20

Radcliffe-Smith, A. & Harley, M.M. (1990) Notes on African Euphorbiaceae XXI: *Aerisilvaea* & *Zimmermanniopsis*, two new Phyllanthoid genera for the Flora of Tanzania. Kew Bull. 45, 147-156.

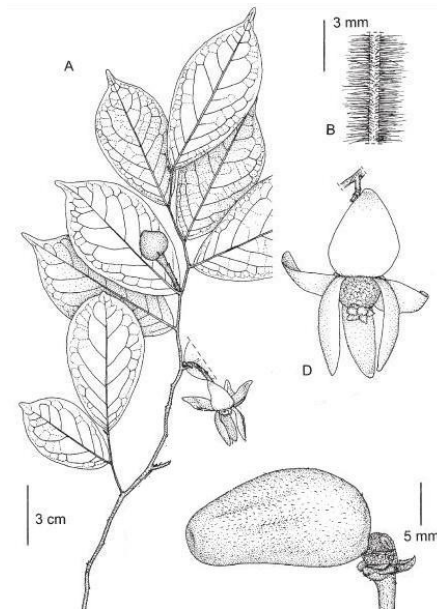


Status global: **Vulnerable (V)** Status local: **Restricted**

Endemic small tree probably restricted to a small area of Kimboza. Considered to be Vulnerable to extinction.

**Striking identification features**

- creamy flowers
- small brown monocarp
- young shoots have dense hairs



**Description**

*Stature:* treelet.

*Size:* recorded to be around 3 m tall and stems 3 cm in diameter.

*Bark:* smooth bark with grey patches.

*Leaves:* alternate, simple, dark green above and light green below (7-14 cm long, 3-6 cm wide).

*Flower:* single axillary bisexual flowers (ca 2 cm), 6 petals. Flower buds and petals are cream coloured.

*Fruit:* densely hairy brown monocarp (2 cm long).

*Seed:* about 2 per monocarp.

Left: Note B. young shoot with erect hairs.



**Status and distribution:** Endemic species restricted to Kimboza. A few individuals have been recorded at an altitude of around 250 m, including some along the road, and appears to have limited distribution (Couvreur *et al.*, 2009; Samwel, 2010). Couvreur *et al.* (2009) assessed the species as Vulnerable thus capable of becoming Critically Endangered or even Extinct in a very short time period.

**Habitat requirements:** As it is found along roadsides it probably regenerates well in disturbed areas but appears to grow well under full shade (Fig. 5.1 in Samwel 2010).

**Phenology:** Flowers recorded in November, and fruits in July and November.

**Reproduction:**

**Uses in East Africa:** None are known.

**Locals uses:** None are known. Samwel (2010) has investigated the leaves for biologically active compounds.



**Sources and further information**

*Botanical description:* Beentje (1994)

*Herbarium specimens:*

Couvreur 85 (type: WAG, isotypes: MO,NHT,DSM,OWU), 26-11-2006  
Couvreur & Mbago 75 (DSM,OWU,WAG), 25-11-2006

Dagallier & Mbago 46  
(K,DSM,MPU,P,W), 2019-11-19, fl  
Kayombo *et al.* 5323 (MO,OWU), 20-03-2006

Dagallier & Mbago 48  
(BR,K,DSM,MPU,P,W), 2019-11-19, fl  
Luke 7650 (EA,K,MO), 19-09-2001  
Luke 8802 (BR,EA,K,MO,NHT,US), 13-06-2002

Rodgers *et al.* 2640 (K), 10-1983  
Semsei 810 (FHO,K,TFD), 07-1952

Couvreur, T.L.P., van der Ham, R.W.J.M., Mbele, Y.M., Mbago, F.M. & Johnson, D.M. (2009) Molecular and morphological characterization of a new monotypic genus of Annonaceae, *Mwasumbia*, from Tanzania. Syst. Bot. 34, 266-276.

Couvreur, T.L.P., Niangadouma, R., Sonké, B. & Sauquet, H. (2015) *Sirdavidia*, an extraordinary new genus of Annonaceae from Gabon. PhytoKeys 46, 1-19.

Samwel, S. (2010) Antimicrobial, antiviral, larvicidal and other secondary metabolites from Tanzanian Annonaceae species. Ph.D. Thesis, University of Dar es Salaam.

***Necepsia castaneifolia* subsp. *kimbozensis***  
**(Radcliffe-Smith) Bouchat & J. Léonard**

Euphorbiaceae

- *Neopalissya castaneifolia* (Baillon) Pax subsp. *kimbozensis*

Status global: **Restricted (E)** Status local: **Present and Endangered**

A small tree only known from 3 small areas in Zimbabwe, northern Madagascar and Tanzania where it is only found in Kimboza.

**Striking identification features**

- petiole with pulvinus at apex and base
- dioecious



**Description**

*Stature:* small tree.

*Size:* to 12 m.

*Bark:* smooth and dark.

*Leaves:* alternate, simple (9.5-19.5 x 4-9 cm), petiole with pulvinus at apex and base.

*Flower:* dioecious, but only female flowers known, axillary inflorescences.

*Fruit:* trilobate/ bilobate (0.7-0.8 cm long, 1.5 cm diameter). Note that Bouchat & Léonard (1986) stated that the fruit has never been collected.

*Seed:*



**Status and distribution:** This taxa occurs in 3 distinct geographical locations, in northern Madagascar, one forest in Zimbabwe and Kimboza in Tanzania. For each locality a subspecies has been recognized. It has been collected once and the Kimboza subspecies was assessed in 1998 as Endangered.

**Habitat requirements:** A forest species. No information is available for Kimboza.

**Phenology:**

**Reproduction:** Dioecious.

**Uses in East Africa:** None are known.

**Locals uses:** The wood is used for firewood, building poles and tool handles. The tree is suitable for shade and for ornamental purposes.

**Sources and further information**

*Botanical description:* Bouchat & Léonard (1986), Lovett *et al.* (2006), Radcliffe-Smith (1984)

*Herbarium specimens:*

Rodgers *et al.* 2560 (DSM,K), 1983-07

Bouchat, A. & Léonard, J. (1986) Révision du genre *Necepsia* Prain (Euphorbiacée africano-malgache). Bull. Jard. bot. Nat. Belg. 56, 179-194.  
Lovett, J.C., Ruffo, C.K., Gereau, R.E., Taplin, J., Sørensen, L. & Lovett, J. (2006) Field guide to the moist forest trees of Tanzania. CELP, Frontier-Tanzania and CEPF.

Radcliffe-Smith, A. (1984) Notes on African Euphorbiaceae: XIV. Kew Bull. 39, 785-796.

## *Pavetta crebrifolia* Hiern

Rubiaceae

var. *kimbozensis* (Bremek.) Bridson - *Pavetta kimbozensis* Bremek.

Status global: **Restricted (VU)** Status local: **Common**

This evergreen shrub is a sub-species restricted to Kimboza forest. It is very common in much of the undergrowth.

### Striking identification features

- showy white terminal inflorescences
- round black fruits
- opposite simple leaves



### Description

*Stature:* evergreen shrub.

*Size:* 1-4 m tall.

*Bark:* young branches glabrous or pubescent.

*Leaves:* opposite simple leaves (3.5-12 × 1.5-5.5 cm) with short petioles (0.3-2 cm long).

*Flower:* on showy terminal inflorescences (2-4 cm across). Many white small flowers.

*Fruit:* globose black drupe, with persistent calyx, 8-11 mm.

*Seed:* greyish black, 5 mm wide.



**Status and distribution:** Found in eastern Africa from Somalia to Tanzania. In Kimboza it is a very common shrub. It is now recognized as a subspecies of *Pavetta crebrifolia*.

**Habitat requirements:** As it is common on the forest floor and recorded at 440 m on the hill overlooking Kimboza, it appears to have broad ecological requirements.

**Phenology:** Evergreen. Recorded as flowering in July and November. Probably flowers most of the year.

**Reproduction:**

**Uses in East Africa:** None are known.

**Locals uses:** None are known.



### Sources and further information

*Botanical description:* Bremekamp (1956), Bridson (1978)

*Herbarium specimens:*

*Herbarium specimens* - Kimboza:

Semsei 761 (K,EA?), 1952-07

Semsei 809 (K,EA?), 1952-07

Semsei 1398 (K,EA), 1955-11

Polhill & Wingfield 4627, 1974-12-31

Cribb & Grey-Wilson 10406, 1976-01-24

Leliyo 104 (NHT), 1981-08-31

Mwasumbi 12376(DSM), 1983-04

Festo 2231 (EA,K,MO,NHT), 2006-03-21

*Herbarium specimens* - Milawilila:

Mhoro 381 (BR), 2000-08-21

*Field record* - Kirugo:

Binggeli 2023-05-22, fr. GPS: close to 368984-9224387, alt. 441m

Bremekamp, C.E.B. (1956) New species of *Oldenlandia*, *Conostomium* and *Pavetta* from tropical Africa. Kew Bull. 11, 169-178.

Bridson, D.M. (1978) Studies in *Pavetta* (Rubiaceae subfam. Cinchonoideae) for Part 2 of 'Flora of Tropical East Africa: Rubiaceae. Kew Bull. 32, 609-652.



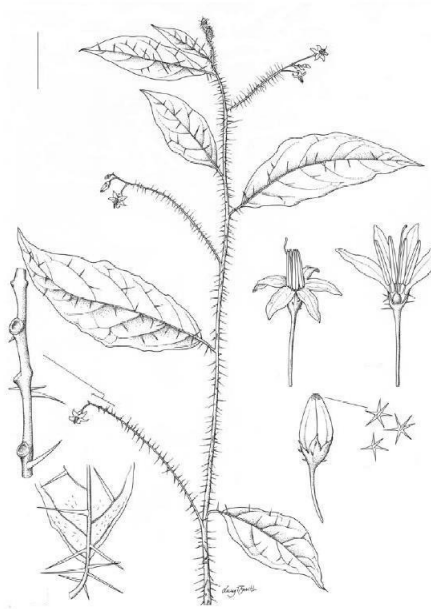
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Status global: **Critically Endangered (CR)** Status local: **Locally rare**

This shrub was thought to be probably extinct, but a few individuals were discovered in Kimboza in late 2023.

**Striking identification features**

- prickly leaves
- flexible prickly stems

**Description***Stature:* Scrambling shrub.*Size:* to about 1 m high.*Bark:* flexible prickly stems.*Leaves:* alternate prickly leaves (9-2 x 2.5-4.5 cm).*Flower:* lateral inflorescences with 10-15 flowers.*Fruit:* small (ca 9 mm long), red when ripe containing about 20 seeds.*Seed:* -

**Status and distribution:** The only collection of this species was made in 2000 at an unspecified location in or around Ruvu Forest Reserve and it was described in 2010. Despite an extensive field search in March 2010 the species was not relocated and was thought to be probably extinct. In late 2023 a few specimens were located inside Kimboza.

**Habitat requirements:** It grows in fairly open conditions on limestone outcrops in hollows or large crevices where organic matter accumulates. It is threatened by fires and the spread of the invasive neotropical tree *Cedrela odorata*.

**Phenology:** Recorded as flowering in July 2000, October, November and December 2023. Observed as fruiting in October 2023.

**Reproduction:** -**Locals uses:** None are known.

The rocky habitat where *S. ruvu* grows. Note that in the foreground the ground vegetation has repeatedly been destroyed by fires.

**Sources and further information***Botanical description:* Vorontsova & Mbago (2010)*Herbarium specimens:*

Mhoro UMBCP 113 (K, MO) 2000-07-17, type, fl.

Vorontsova, M.S. & Mbago, F.M. 2010 New *Solanum* species from Tanzanian coastal forests may already be extinct. J. E. Afr. Nat. Hist. 99, 227-234.

## *Streptocarpus kimbozanus* B.L. Burt

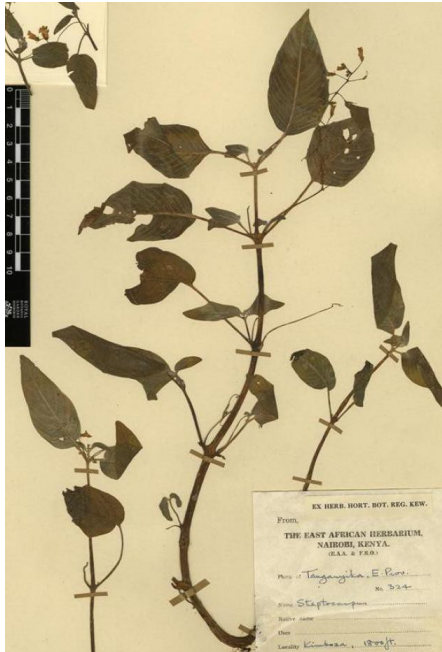
Gesneriaceae

Status global: **Critically Endangered** Status local: **Critically Endangered**

This herb is restricted to Kimboza Forest and only appears to occur on the slopes close to the River Ruvu.

### Striking identification features

- small herb 20-40 cm tall
- ca 10 white flowers on axillary inflorescences



### Description

*Stature:* annual herb.

*Size:* usually 20-40 cm tall.

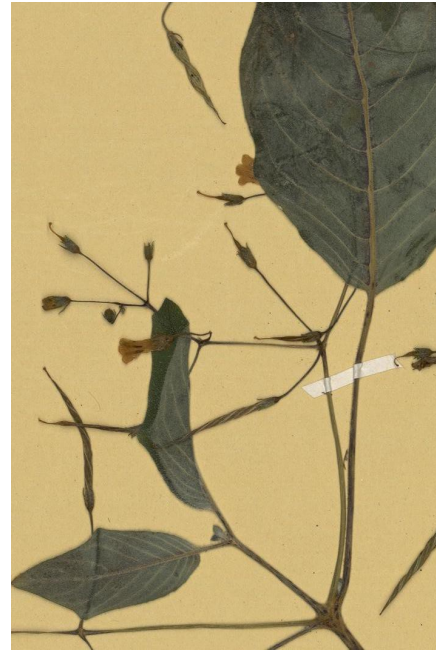
*Bark:* stems simple or branching in the lower half.

*Leaves:* opposite, 6-7.5 cm long, 2.5-3.5 cm wide.

*Flower:* inflorescences: axillary, solitary, up to 10-flowered. Flowers white and up to 1 cm in size.

*Fruit:* capsule 12-20 mm long, 1-1.5 mm diameter.

*Seed:* 0.45 mm long.



**Status and distribution:** This species is restricted to Kimboza Forest and only appears to occur on the slopes close to the Ruvu River. Presumably it has a small population size. Assessed in 2008 as Critically Endangered. First collected in 1954 and described in 1958. Only collected six times.

**Habitat requirements:** From its restricted distribution within Kimboza Forest it appears to have rather narrow environmental requirements. Reported as occurring near a stream at the edge of the groundwater forest on damp limestone rock.

**Phenology:** Flowering recorded in January, April, June and September. Seeds collected in November 1972.

**Reproduction:** -

**Locals uses:** None are known.



### Sources and further information

*Botanical description:* Darbyshire (2006)

*Herbarium specimens:*

Padwa 324 (E,K,NU), 1954-04-01

Polhill & Lovett 4911 (E,K,P), 1983-06-24

Pócs & Hall 8653/L, 1986-04

Mwasumbi 12382, 1988-04?

Luke *et al.* 7652, 2001-09

C8334 (E), 1972-11 from seed

Hilliard, O.M. & Burt, B.L. (1971) *Streptocarpus*, an African plant study. University of Natal Press, Pietermaritzburg.

Darbyshire, I. (2006) Gesneriaceae. In Beentje, H.J. & Ghazanfar, S.A. (Eds) *Flora of Tropical East Africa*, pp. 1-75. Royal Botanic Gardens, Kew.

## *Thunbergia* sp. nov. 'kimboza'?

Acanthaceae

-

Status global: **Restricted (ce)** Status local: **Rare**

Thought to be an as yet undescribed endemic sub-shrub. Reported to occur inside Kimboza and in forest remnants nearby.

### Striking identification features

- opposite, simple with toothed margins
- showy purplish/yellow flowers



### Description

*Stature:* sub-shrub with arching stems.

*Size:* to about half a meter tall.

*Bark:*

*Leaves:* opposite, simple with toothed margins.

*Flower:* many flowered inflorescences in leaf axil, the large showy flowers are purplish-yellow.

*Fruit:* not known.

*Seed:* not known.



**Status and distribution:** This is thought to be an undescribed species and was identified by Q. Luke. This specimen was collected in the Kimboza-Ruvu region about 3 km NE of Kimboza in December 2022.

**Habitat requirements:** The plant was found in rock outcrop that has not been affected by deforestation and repeated fires. The site also harbours other notable species such as *Cola quentinii* and the endangered *Isolona linearis*, recorded for the first time in the Uluguru mountains.

**Phenology:** Flowered in December 2022.

**Reproduction:**

**Uses in East Africa:** None are known.

**Local uses:** None are known.

### Sources and further information

*Botanical description:*

*Herbarium specimens:*

Binggeli *et al.* (NHS), 2022-12-07, fl



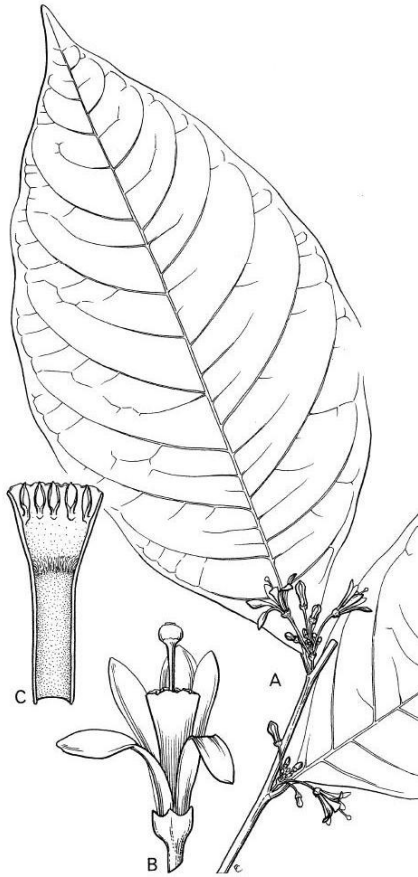
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Status global: **Endemic (E)** Status local: **Rare**

A rare endemic shrub restricted to Kimboza and found in groundwater forest. It is threatened with extinction.

**Striking identification features**

- fruit orange with a bright red aril
- very sparsely branched shrub (1-2 m tall).



**Description**

*Stature:* a shrub, very sparsely branched.

*Size:* 1-2 m tall, stems 2-3.5 mm thick.

*Bark:* smooth, pale grey-brown, leaf scars prominent (c. 2 mm high, 3mm wide).

*Leaves:* simple (blade up to 21 × 10 cm).

*Flower:* axillary inflorescence with 7-15 flowers

*Fruit:* 1-2 per infructescence, contain 4-6 seeds, open by 5-6 valves (to 2-5 cm wide).

*Seed:* (8 x 4-5 mm); black, glossy, partly enveloped in a layer of red fleshy tissue.

*Note:* the local name means 'wild pepper'.



**Status and distribution:** This species is endemic to Kimboza and has only been collected four times in the 1980s and was described in 1989. It is probably a rare or uncommon plant and has a very limited distribution, thus it is threatened with extinction. It was previously reported as *Turraea vogelioides* Bagshw & Baker F., a species found much further West.

**Habitat requirements:** The only information available is from the herbarium sheets. The labels state that the samples were collected at an altitude ranging from 300 to 450 m in groundwater forest on crystalline limestone. However, this rock formation hardly occurs above 350 m.

**Phenology:** Flowering and fruiting in April 1983 and 1988, and fruiting in June 1983. Fruits maturing in May 2023 and June 2022 and fully mature at the end of August 2023.

**Reproduction:**

**Locals uses:** None are known.



**Sources and further information**

*Botanical description:* Cheek (1989), Styles & White (1991)

*Herbarium specimens:*

Bidgood *et al.* 1240 (K,EA,DSM,FHO),

1988-04-21 – type

Mwasumbi *et al.* 12480, (DSM,K), 1983-04-02

Mwasumbi *et al.* 12482, (DSM,K), 1983-04-02

Polhill *et al.* 4906 (DSM,K), 1983-06-

Luke 7651 (EA), 2001-09-19

Luke 8794 (EA,K,MO,NHT), 2002-06-13

Kayombo 5352 (EA,K,MO,NHT), 2006-03-20

Cheek, M. (1989) A new species of *Turraea* (Meliaceae) from Tanzania. Kew Bull. 44, 465-468.

Styles, B.T. & White, F. (1991) Meliaceae. In Polhill, R.M. (Ed.) Flora of Tropical East Africa. A.A. Balkema, Rotterdam.

-

Status global: **Endemic (CR)** Status local: **Rare**

A newly described small tree that occurs only in Kimboza Forest Reserve among rock outcrops. It is Critically Endangered.

**Striking identification features**

- lightly raised mid-rib above with a central depression along its length
- showy, large flowers on trunk/stem
- 600+ stamens and 11 to 16 carpels



**Description**

*Stature:* a small tree.

*Size:* 5-7 m tall, DBH 15-20 cm.

*Bark:* young branches sparsely pubescent to glabrous, old branches glabrous.

*Leaves:* alternate, petiole 4-5 mm long, elongated blade (14.7-21.5 x 4.4-6.8 cm), glabrous midrib slightly raised with a central groove all along above, raised below, 12-17 pairs of lateral veins.

*Flower:* 1-11 bisexual flowers on inflorescences borne on the trunk and old branches, hairy buds globose (7-16 mm in diam), 3 cream - purple-red outer (to 3 cm) and 3 inner (to 4 cm) petals, 600+ stamens and 11 to 16 carpels.

*Fruit:* Not known.

*Seed:*

*Note:* It is very similar to *U. kirkii* but with larger leaves, more rounded leaf base, having a leaf mid-rib slightly raised above with a central depression all along the length of the midrib, + flower characteristics like nearly flat petals.



**Status and distribution:** This species is endemic to Kimboza Forest Reserve. First collected in 1987 and identified as *U. kirkii*, but recognized and described as a new species in 2023. It has been assessed as Critically Endangered - CR (B1ab(iii)+2ab(iii)).

**Habitat requirements:** It is found in high forest of Kimboza, an habitat defined by its dolomitic marble outcrops and its groundwater/swamp forest. Fig 27. in Dagallier *et al.* (2023) shows that the type specimen was found in an area of relatively undisturbed with many small rock outcrops.

**Phenology:**

**Reproduction:** Found to be flowering in March and November.

**Uses in East Africa:** None are known.

**Local uses:** None are known.



**Sources and further information**

*Botanical description:* Dagallier *et al.* (2023)

*Herbarium specimens:*

Couvreur 71 (DSM,MO,WAG), 2006-11-25

Dagallier 49 (DSM,K,MPU,P,WAG), 2019-11-19, fl., type

Kayombo 5357 (MO), 2006-11-21

Luke 766 (EA), 1987-11-04

Dagallier, L.-P.M.J., Mbago, F.M., Couderc, M., Gaudeul, M., Grall, A., Loup, C., Wieringa, J.J. Sonké, B., Couvreur, T.L.P. (2023) Phylogenomic inference of the African tribe Monodoreae (Annonaceae) and taxonomic revision of *Dennettia*, *Uvariodendron* and *Uvariopsis*. *PhytoKeys* 233, 1-200. doi:10.3897/phytokeys.233.103096

Left: leaf base with a slightly raised mid-rib above and a central depression all along its length.

***Vitex morogoroensis*** Walsingham & S. Atkins

Verbenaceae

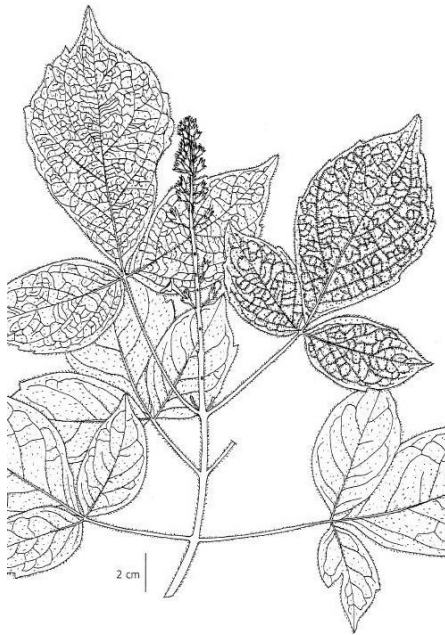
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Status global: **Endangered (E)** Status local: **Endangered**

This shrub/climber has only been collected once from Kimboza Forest and thus is likely to be rare.

**Striking identification features**

- trifoliolate leaves
- hollow stems



**Description**

*Stature:* shrub or climber with hollow stems.

*Size:* -

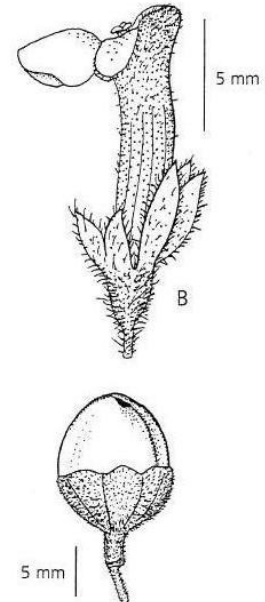
*Bark:*

*Leaves:* trifoliolate, leaflets 8-14 cm long, 4.5-7.5 cm wide. Central leaflet longer and broader.

*Flower:* unbranched inflorescence composed of opposite (1-)2-3-flowered cymes, denser towards the apex. Flowers about 1cm long with reddish calyx and creamy white corolla.

*Fruit:* ovoid 1.4 cm long and 1 cm wide, a shallow cup, covered with a short hairs.

*Seed:*



**Status and distribution:** Only from Kimboza and Mkungwe forests in the Morogoro District. Only two collections ever made. It is unlikely to be abundant in view of the numerous plant collections made at Kimboza. Assessed as Endangered. First collected in 1983 and described in 2006.

**Habitat requirements:** Unknown.

**Phenology:** Flowering recorded in July.

**Reproduction:** Insect-pollinated.

**Uses in East Africa:** None are known.

**Locals uses:** None are known.

**Sources and further information**

*Botanical description:* Walsingham & Atkins (2006)

*Herbarium specimens:*

Rodgers *et al.* 2581 (K) 1983-07

Walsingham, L. & Atkins, S. (2006) A new species of *Vitex* (Labiatae) from Tanzania. Kew Bull. 61, 615-617.

