

## ***Etlingera loerzingii* (Zingiberaceae) — A GORGEOUS TORCH GINGER FROM SUMATRA GROWN IN BOTANIC GARDENS**

*Etlingera loerzingii* (Zingiberaceae) – Jenis jahe-jahean dengan perbungaan menarik dari Sumatera koleksi kebun raya

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### Abstract

Tiga belas jenis *Etlingera* telah dideskripsi berdasarkan material yang diperoleh dari Sumatera, selanjutnya lima jenis lainnya telah didokumentasi sebagai catatan baru (*new records*). Salah satu jenis *Etlingera* dari Sumatera yang cukup spektakuler adalah *Etlingera loerzingii*. Deskripsi asli jenis ini dahulu dibuat berdasarkan material yang tidak lengkap, dan sekarang deskripsi lengkapnya disajikan di dalam tulisan ini. Dengan daun yang indah serta bentuk dan warna perbungaan yang menarik, *E. loerzingii* memiliki potensi untuk dikembangkan sebagai tanaman hias.

**Keywords:** Bogor Botanic Gardens, Lörzing, *Nicolaia* inflorescence type, ornamentals.

### INTRODUCTION

The genus *Etlingera* Giseke (Zingiberaceae) is common throughout Malesia and especially rich in species in the perhumid forests of Sumatra. Many species are useful not least as ornamentals in botanical gardens and tropical parks.

Thirteen species of *Etlingera* have been published based on material from Sumatra (Jack 1822; Ridley 1917, 1923, 1926; Roxburgh 1820; Schumann 1899, 1904; Teijsmann & Binnendijk 1862; Valetton 1921). These species were originally described in *Achasma*, *Alpinia*, *Amomum*, *Elettaria*, *Geanthus*, *Hornstedtia*, *Nicolaia* and *Phaeomeria* but most were placed in *Etlingera* by Rosemary Smith in 1986. A further five

known species described from Java or Peninsular Malaysia have been documented in the course of three field trips led by the first author to Sumatra in 2004–2006, namely *E. coccinea* (Blume) S. Sakai & Nagam., *E. crispata* C.K. Lim, *E. foetens* (Blume) R.M. Sm., *E. maingayi* (Baker) R.M. Sm., and *E. megaloscheilos* (Griff.) A.D. Poulsen. Thus at least 18 species of *Etlingera* occur in this island. Of these, half of those presently known have a tall and erect peduncle. Species of *Etlingera* with this type of inflorescence are sometimes referred to as torch gingers or of the *Nicolaia*-type, the most commonly known being *Etlingera elatior* (Jack) R.M. Sm. which was originally described based on Sumatran material. It is still unexplained why such a high percentage of Sumatran *Etlingera* has this type as compared to other Malesian islands.

During our first field trip to Sumatra in 2004, we came across a huge species of *Etilingera* with a *Nicolaia*-type inflorescence that initially was difficult to identify. After a close examination of the protologues and available types we are able to provide a complete description below and to document the colour variation of the bracts which may be confusing the identification.

## MATERIAL AND METHODS

Measurements follow Poulsen (2006). As additional flowering material is collected, allowing detailed measurements, a wider range can be expected to some of the character measurements included in the description below.

Assessments of conservation status were carried out following IUCN (2000), based on current knowledge and using their terminology on categories, criteria and subcriteria.

## RESULTS AND DISCUSSION

### *Etilingera loerzingii* (Valeton) R.M. Sm.

*Etilingera loerzingii* (Valeton) R.M. Sm., Notes Roy. Bot. Gard. Edinburgh 43 (1986) 247; Newman *et al.*, Checkl. Zingib. Malesia (2004) 79. **Basionym:** *Nicolaia loerzingii* Valeton, Bull. Jard. Bot. Buitenzorg ser. 3, 3 (1921) 136, t. 5 (figs. 6–11). **Type:** J.A. Lörzing 4299 (holo BO), above Bandar Baru (estimated to be 3°16'S, 98°33'E), 950 m, forest, 17 June 1916.

### *Description*

Terrestrial herb in loose clump (to 15–25 cm between leafy shoots), not stilt-rooted. **Leafy shoot** 2.5–7 m long, sometimes arching (then 2.5–5 m tall), with up to 25 leaves per shoot; base to 7–9 cm diameter, red or greenish brown, pubescent, distinctly swollen; sheath red when young, dark green when mature, ± reticulate, ± pubescent, margin ciliate; ligule to 1.5–2 mm long, ± emarginate, longest in the central part of the shoot, pubescent, beige-green to reddish, ± tomentose, margin ciliate; petiole 15–40 mm long, tomentose; lamina narrowly elliptic, 87–95 × 20–28 cm, average length to width ratio 3.9, ± plicate, dark mid-green and glabrous

above, beneath tinged ± reddish brown, especially when young, ± pubescent; base oblique, cuneate to distinctly cordate; apex acute; margin red with 1 mm long, white hairs. **Flowering shoot** 30–90 cm long, arising from base of leafy shoot, erect, receptacle 1.5–4 × 2.5–3 cm, conical, with 145–170 flowers, 10–28 open at a time; peduncle 20–80 cm long, densely tomentose, often exposed, peduncular bracts to 11 × 2 cm, distant, exposing the axis; upper bracts five, 9 × 4 cm, covering base of spike, ovate to narrowly ovate, bright red, turning brown, drying blackish, pubescent at base, scattered hairy elsewhere, a few hairs at shortly mucronate apex; length of spike (including flowers) to 6–10 cm long, obconical, flowers extending 1 cm above the bracts, spike including bracts 6–9 × 12–15 cm; sterile bracts: 13–15, lower ones 6.5–9 × 1.8–5 cm, lowest one biggest, erect, spreading, upper ones 6.5–8 × 1.4–2.5 cm, ovate to narrowly elliptic, upper margin inrolled forming pointed semi-tubes, apex rigid and pointed, pale red with yellow-green or whitish margin and apex, lower ones turning brown with age, pubescent at base, with few short hairs scattered near apex; fertile bracts: outer ones 7.5 × 2.4 cm similar to sterile bracts; inner ones faintly pink at base, otherwise pale yellow-green, as small as 4 × 0.4 cm, elliptic to strap-shaped, apex mucronate, yellow-green and reddish near base, glabrous, with few hairs at base and apex; bracteole 2.1–2.8 cm long, membranous, transparent white, with one fissure of 1–1.5 cm long, glabrous except for a few hairs near base and apex, apex 2-toothed, tufted. **Flower** 5.7–6.2 cm long; ovary to 10 × 5 mm, densely pubescent; calyx 4.2–4.6 cm long, reaching 5–6 mm longer than stamen and 0–3 mm longer than corolla lobes; faintly pink at base, white in lower half and yellow-green in upper; with one fissure for 2.5 cm; glabrous except for a few hairs at base and apex; apex 3-toothed, teeth shortly mucronate, close together, upper part forming a separate semi-tube; corolla tube 2.4–2.9 cm long, white, ± pubescent dorsally, staminal tube densely pubescent, tube inside with dense bands of hairs coinciding with the insertion of corolla lobes and ± hairy above inside staminal tube; lobes white to pale yellow-green, glabrous, lateral lobes reaching 3–6 mm longer than stamen; dorsal lobe 26–27 × 8 mm, spatulate, cucullate, pressed outwards by lateral lobes of the labellum; lateral lobes 30 × 6 mm, spatulate,

cucullate, attached  $\pm$  straight to the tube, inserted 3–4 mm below dorsal lobe; staminal tube 8.5–12 mm long; labellum ovate, 22–25  $\times$  20–21 mm, red with narrow white margin, dark red near apex of terminal lobe, roughly papillose in centre extending into the corolla tube centre, glabrous, lateral lobes  $\pm$  erect, lobes meeting above stamen, margin sometimes with few hairs at base, central lobe  $\pm$  emarginate, extending 9–11 mm longer than anther, margin slightly recurved; stamen 11–13 mm long, whitish; filament 2.5–4  $\times$  2.5 mm, outside densely pubescent, white; anther 10 mm long, 3 mm wide at base 4.5–5 mm wide at apex, emarginate, incision 1.5–1.8 mm, pubescent dorsally near base, angled 130–150°, pale red with darker apex to plain white, anther crest absent; thecae dehiscent in upper half for 4 mm to 1 mm below apex, with a few hairs at base, margin and apex; epigynous glands 4–5 mm long, bilobed with slit to base only on one side or completely bipartite, apex roughly warty; style 3.5–3.8 cm long, pubescent in upper part; stigma 2.5–3.8 mm wide, glossy dark red, club-shaped, sometimes with few scattered hairs, ostiole a narrow, transverse, apical slit, facing downwards. **Infructescence** head to 12 cm diam., subglobular, bracts not persistent, with c. 60 fruits per head, fruit 5.5  $\times$  2.5 cm, obpyriform, sides angular, apex conically beaked c. 1.5 cm, red, pubescent; aril red. (Plate 1.)

#### Uses

Young leafy shoots and inflorescences are edible and delicious. The smell and taste is sweet, sour and aromatic similar to *E. elatior* (in Sumatra known as *encung*, *kincung*, *siala*, or *cikala*). Already in the original description, Valeton (1921) mentioned that the plant produced a strong smell when bruised.

#### Etymology

Valeton gave the epithet in honour of Julius August Lörzing (1872–1945) who established the botanic garden at Sibolangit, North Sumatra in 1915. *E. loerzingii* was collected in the foothills of Gunung Sibayak not far from there.

#### Ecology and habitat

*Etlingera loerzingii* is found in primary, forest margins and in disturbed vegetation at 60–1400 m asl. along the Barisan Range. It thrives in open areas and is

thus easy to grow in tropical gardens. We have, however, not seen it produce fruit in cultivation, indicating that it may depend on a natural pollinator to set seeds. The pollinators are likely to be spiderhunters (birds) and bees as for other species of the genus (Kato *et al.* 1993, Poulsen 2006).

#### Distribution

*Etlingera loerzingii* is endemic to Sumatra along the lower slopes of Barisan Range (Figure 1.).

#### Conservation status

VU B1ab(iii). Vulnerable by extent of occurrence estimated <20,000 km<sup>2</sup>, known from <10 locations, and decline in the extent and quality of lowland forest habitats in Sumatra.

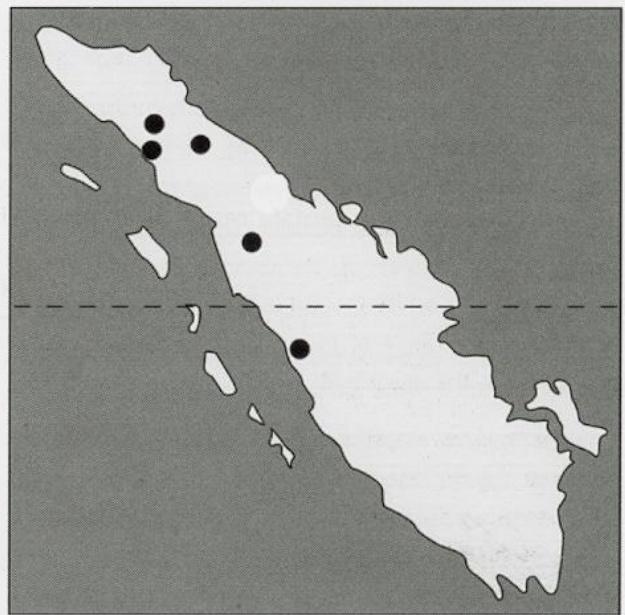


Figure 1. Distribution of *Etlingera loerzingii* in Sumatra.

#### Additional material examined

**Aceh Province.** Gunung Guhra, Ketambe, valley of Lau Alas tributary of Lau Ketambe, Gunung Leuser NP, c. 35 km NW of Kutatjane, 200–400 m, 7 June 1972, flowering, *Wilde, W.J.J.O. de & Wilde-Duyffes, B.E.E. de 12701* (BO, L); S. Kloët, Kloët Nature Reserve, along Krung (= river) Lembang, vicinity of Pucuk Lembang, Gunung Leuser NP (3°05'N, 97°25'E), 60 m, 10 July 1985, flowering and fruiting, *Wilde, W.J.J.O. de & Wilde-Duyffes, B.E.E. de 19912* (BO, KLU, L); **North Sumatra**

**Province.** Bandar Baru, G. Sibayak, 6 Aug 1921, flowering, *Mhd. Nur 7344* (BO, K, SING); Barumon Wildlife Reserve, Dusun Simar-dona, 520 m, originally collected as *Syamsudin 89*, cultivated at Bogor Botanic Gardens (XI.B.III.169), flowering, 6 February 2008, *Poulsen, A.D., Marlina Ardiyani & Yessi Santika 2598* (BO, E); Sicikeh-cikeh Nature Recreation Park, 1400 m, 25 October 2008, *Dwi Ratna 15* (not deposited in official herbarium); **West Sumatra Province.** Ladang Padi, arboretum at Taman Hutan Raya Bung Hatta, open park with trail system, probably not planted, (0°57'S, 100°31'E), 600 m, first collected 19 February 2004, flowering 2 March 2004, *Poulsen, A.D., Deden Girmansyah & Ikbal Hatta 2239* (BO, ANDA, AAU, E), cultivated at E from seeds from previous locality, collected 8 September 2008, flowering, *Poulsen 2733* (E, SING).

#### Notes

*Etlingera loerzingii* is easily distinguished from other long-pedunculate species by the burgundy-red peduncular scales and red to yellow-green bracts that are erect and spreading (Plate 1, B–F). Valetton (1921) described the colour of the bracts as coral-red or incarnate with a white margin but the colours may vary across a wider range of material, though the bract is always red in the lower half.

Herbarium material is easily confused with the common *Etlingera elatior* in having a tall and erect inflorescence raised above the ground, but *E. loerzingii* differs in the inflorescence being shorter (to 0.8 m not 2 m), the sterile bracts erect to spreading and red with yellow-green tips rather than recurved and pink with a white margin, and in having a longer calyx (4.2–4.6 cm vs. 3–3.5 cm). Also, the receptacle is only up to 4 cm long (not 10 cm as in *E. elatior*) and the fruits are beaked (not rounded with a depressed apex).

*Etlingera hemisphaerica* (Blume) R.M. Sm. has leaves which are burgundy-red beneath and it also has a long, erect inflorescence. Its bracts, however, are rounded and not pointed as in *E. loerzingii*.

Valetton (1921) gave the locality as “Deli, Bandar baroe” on p. 136 but, on the label of the type, Deli is not mentioned; written in pencil in Dutch it says “boven

Bandar Baroe” – meaning above Bandarbaru, which also corresponds to the elevation of 950 m. The first author visited this area in 2005 and came across big plants that were not flowering but matched very well the material of *E. loerzingii* collected near Padang (*Poulsen et al. 2239*).

The illustration of the type in Valetton (1921; plate 5, figs. 6–11) was based on a mature bud in which the labellum is not fully inflated. The drawing emphasizes a constriction of the corolla tube. In the recently pickled material examined, densely hairy bands are visible inside the tube corresponding to the insertion of lobes outside. They do not have the exact appearance of the constrictions as drawn in Valetton 1921, but maybe the artist used an inferior microscope. Such hairy bands are also found in *E. elatior*. Their function is not clear (*Poulsen 2006*), but they may serve to keep and protect the nectar in the bottom of the corolla tube.

The type of *E. loerzingii* is almost glabrous but material collected from further south or north is more pubescent. This is consistent with several species studied in Borneo (*Poulsen 2006*) where the indumentum on various parts of the leafy shoot is variable and does not serve as a reliable diagnostic character. The peduncle of the type is also entirely glabrous as is that of *Mhd. Nur 7344* from the same locality. Collections by *Poulsen et al.* have a dense indumentum on the peduncle. From Gunung Leuser NP to the north, *de Wilde & de Wilde 12701* is sparsely pubescent whereas in *de Wilde & de Wilde 19912* it is densely so. Perhaps the inflorescence axis is always pubescent at first but becomes glabrous with age.

The collection *Afriastini 786* (BO), Bukit Palelawan Nature Reserve, South Sumatra, has beaked fruits that look very similar to those of *E. loerzingii*, but as we have not seen the inflorescence we are not certain of its identity. *Etlingera loerzingii* may also occur in southern Sumatra.

Inflorescences of *E. elatior* exhibit wide colour variation from dark blood-red to snow-white bracts and have for several years been used in the cut flower industry, e.g. in Australia, and plants are often seen flowering in tropical gardens and in green houses in temperate regions. Similarly, *E. loerzingii* has great

potential as an ornamental plant. Also, the young shoot of the inflorescence could be marketed more widely similar to *E. elatior*.

Many more species exist in Sumatra and a revision targeting all of them is needed to evaluate whether the apparent dominance of the *Nicolaia*-type inflorescences in Sumatra still stands. One would anticipate that species with erect and showy inflorescences are more likely to attract the attention of the collecting botanist and as a more thorough study is completed, more species with smaller inflorescences near the ground are likely to be documented.

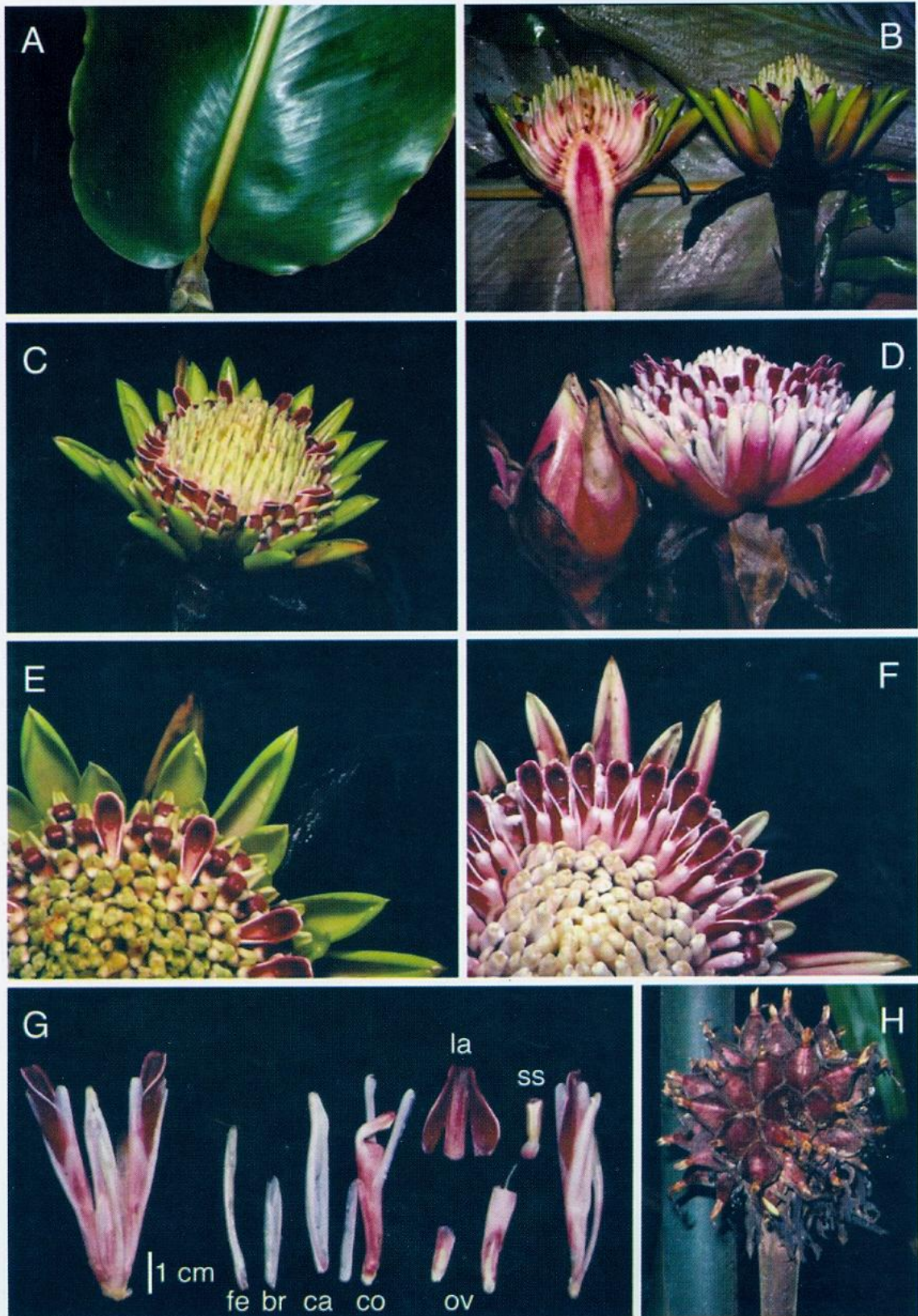
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**Plate 1.** *Etlingera loerzingii*. A. Ligule and base of leaf blade (Poulsen 2733). B. Leaf surface beneath and an inflorescence cut in two (Poulsen et al. 2239). C. Inflorescence (Poulsen et al. 2239). D. Inflorescence (Poulsen et al. 2598). E. Inflorescence, close-up (Poulsen et al. 2239). F. Inflorescence, close-up (Poulsen et al. 2598). G. Flowers: fe = fertile bract, br = bract, ca = calyx, co = corolla tube, labellum removed, la = labellum, ov = ovary and base of corolla tube cut in two, ss = stamen and stigma (Poulsen et al. 2598). H. Infructescence (Poulsen et al. 2239). Photographs by A.D. Poulsen.