

## *Zingiber zhuxiense* (Zingiberaceae), a new species from Hubei, central China

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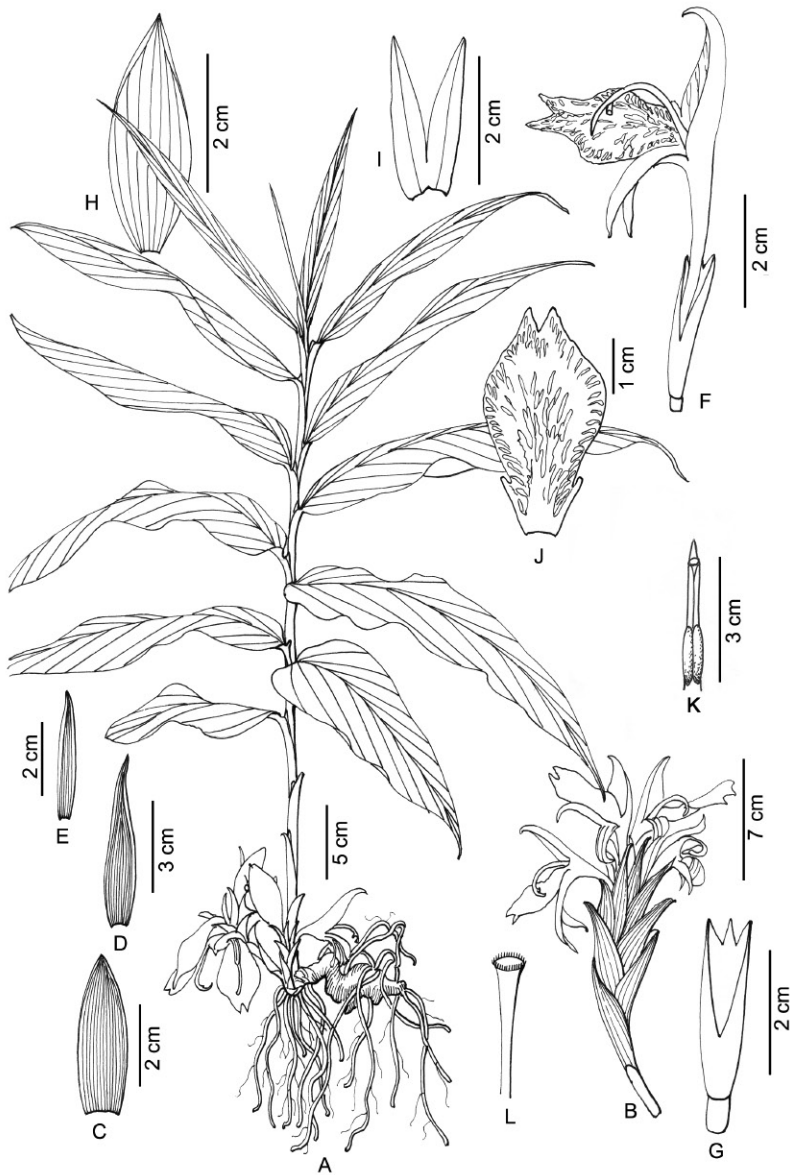
*Zingiber zhuxiense* G.X. Hu & S. Huang, a new species from central China, is described and illustrated. It is most similar to *Z. atrorubens*, but can easily be distinguished from the latter by its shorter leafy shoot, lanceolate bracteole, elliptic dorsal lobe of corolla, obovate and longer labellum, incompletely fused lateral staminodes, longer connective appendage, and glabrous or sparsely puberulent ovary. Known geographical distribution and notes on the ecology of *Z. zhuxiense* are given and a key to the species of *Zingiber* in Hubei Province, China is provided.

*Zingiber* consists of approximately 150 species (Wu & Larsen 2000, Govaerts *et al.* 2007), but new species are discovered continuously. In recent years, two new species of *Zingiber* have been discovered in China (Chen *et al.* 2011, Yeh *et al.* 2012), and a further three in South Asia (Kumar *et al.* 2013, Rahman & Yusuf 2013, Thongam & Konsam 2014). *Zingiber* is widely distributed in tropical and warm temperate Asia, with centers of diversity in Indochina and Borneo (Smith 1989, Theilade & Mood 1997, 1999, Larsen *et al.* 1998, Wu & Larsen 2000). In China, 44 species of *Zingiber* are recorded, of which 35 are endemic in the country (Wu & Larsen 2000, Chen *et al.* 2011, Yeh *et al.* 2012, Sabu *et al.* 2013).

*Zingiber* is distinguished from other genera of Zingiberaceae by having a connective append-

age wrapped around the style. The genus was considered the only member of tribe Zingibereae for a long time (Petersen 1889, Burt & Smith 1972, Larsen *et al.* 1998). However, the current circumscription of Zingibereae, based on molecular evidence, also includes most genera of the former tribe Hedychieae (Kress *et al.* 2002).

During expedition to northwest of Hubei, China in 2009, some specimens and living material of *Zingiber* were collected. The living material was afterwards cultivated in the nursery of the Enshi Dongsheng Plant Development Co. Ltd. After careful examination of the specimens and living material, as well as of literature on *Zingiber* (Wu & Chen 1981, Wu & Larsen 2000, Fu 2002: 575–576), we became convinced that the specimens represented an undescribed species.



**Fig. 1.** *Zingiber zhuxiense* (from the holotype, drawn by Ling Wang). — **A:** Habit. — **B:** Inflorescence. — **C:** Outer bract. — **D:** Inner bract. — **E:** Bractole. — **F:** Flower. — **G:** Ovary and calyx tube. — **H:** Dorsal lobe of corolla. — **I:** Adnate lateral lobes of corolla. — **J:** Labellum and lateral staminodes. — **K:** Stamen and upper part of pistil. — **L:** Stigma.

***Zingiber zhuxiense*** G.X. Hu & S. Huang,  
*sp. nova* (Fig. 1)

TYPE: China. Hubei: Enshi, Zhuxi County, Xiangba Town, Yufeng Village, Xiaodongwan, elevation 1140 m a.s.l., 31°23'49"N, 109°32'20"E, 23 June 2009, among shrubs nearby seasonally drying up creek, Z.E. Zhao, R. Liu & S. Huang *Dongsheng 1348* (holotype HIB; isotypes HIB, KUN). — PARATYPE: China. Hubei: Enshi, Qiliping, elevation 500 m a.s.l. (cultivated from type locality in 2009), 29 June 2010, Z.E. Zhao, R. Liu & S. Huang *Dongsheng 1807* (KUN, HIB).

ETYMOLOGY: The specific epithet refers to the type locality, Zhuxi County, Hubei.

Perennial herbs. Rhizomes yellowish, slightly aromatic, roots fibrous. Leafy shoots 50–60 cm high, ca. 1.3 cm in diameters at base. Bladeless sheaths 4–5, glabrous or with short hairs; leaf sheaths green, puberulent; petioles 0.1–0.3 cm long; ligule membranous, 2-lobed, 0.2–0.5 cm long. Leaves distichous, lanceolate or oblong-lanceolate, 10–28 × 5–6 cm long, adaxially glabrous, abaxially puberulent in lower part, base rounded, broadly cuneate or slightly oblique, margin entire, apex acuminate

**Table 1.** Morphological differences between *Z. zhuxiense* and *Z. atrorubens*.

| Characters         | <i>Z. zhuxiense</i>                                       | <i>Z. atrorubens</i>  |
|--------------------|---|---|
| Leafy shoot        | 50–60 cm  | 80–110 cm   |
| Bracteole          | lanceolate, 3.5–4.0 cm long                               | oblong, 2.3 cm long   |
| Corolla            | dorsal lobe elliptic, lateral ones narrowly lanceolate    | lobes lanceolate  |
| Labellum           | obovate, 4 × 2.5 cm, apex 2-lobed                         | ovate or lanceolate-ovate, 3 × 2 cm, apex entire or emarginated |
| Lateral staminodes | lower part fused to labellum, 0.1–0.4 cm long             | absent or totally fused to labellum                             |
| Stamen             | anther 1.8 × 0.3–0.4 cm, connective appendage 2.2 cm long | anther ca. 1.5 cm, connective appendage ca. 1.5 cm long         |
| Ovary              | glabrous or sparsely puberulent                           | villous   |

to caudate. Inflorescences arising from rhizomes, close to leafy shoots, 16–18 cm long; peduncles embedded in ground, 5–6 cm long, closed with 3–4 white bladeless sheaths; spike obovate, 11–12 × 7–8 cm, consisting of ca. 10 flowers. Bracts imbricate, light green with reddish veins, puberulent, outer bracts ovate-lanceolate, 4.1 × 2.8 cm, inner ones lanceolate, margin membranous, 5.4 × 0.7 cm, bracteoles lanceolate, white green, 3.6 × 0.5 cm, folded. Calyx tube ca. 2.9 cm long, membranous, sparsely puberulent, splitting on one side, apex 3-lobed, lobes triangular, yellowish-white. Corolla tube 5 cm long, white, glabrous, 3-lobed, lobes pink, with conspicuous veinlets, dorsal lobe elliptic, 3.5 × 1.8 cm, apex hooded and acute, lateral lobes narrowly lanceolate, 2.6 × 0.7 cm, base adnate, apex acute. Labellum obovate, dark red, with white striae on both surfaces, 4 × 2.5 cm, apex 2-lobed, lobes triangular, 0.6 × 0.6 cm, margin undulate. Lateral staminodes 2, fusing with labellum at base, upper part free, 0.1–0.4 cm long. Stamens ca. 3.5–4.1 cm long; filaments very short, ca. 0.2 cm, flattened; anther oblong, 1.8 × 0.3–0.4 cm, yellow, glabrous; appendage linear, 2.2 cm long, apex dark red. Pistil 6.7–7.0 cm long; ovary ca. 0.5 cm, glabrous or sparsely puberulent; style 6.2–6.5 cm long, white, filiform, channelled through anther; stigma yellowish with an apical circular aperture surrounded by stiff hairs; epigynous glands 2, ca. 0.5 cm long, yellow. Flowering June to July. Fruit not seen.

DISTRIBUTION AND HABITAT: *Zingiber zhuxiense* is currently known only from the type locality.

It grows among shrubs near a seasonally dry creek at 1140 m a.s.l. Associated plants include *Euptelea pleiosperma*, *Pterocarya hupehensis*, *Sinowilsonia henryi*, *Fraxinus chinensis*, *Acer henryi*, *A. amplum*, *Aconitum scaposum* and *Lonicera fragrantissima* subsp. *standishii*.

Morphologically, *Zingiber zhuxiense* is most similar to *Z. atrorubens*, which is confined to the Chinese provinces of Sichuan and Guangxi. However, it differs from the latter by several characters (Table 1).

Two species of *Zingiber* (*Z. officinale* and *Z. mioga*) were previously reported from Hubei (Fu 2002: 575–576). *Zingiber officinale* is widely cultivated as spice throughout the province, and *Z. mioga* is distributed in western Hubei. A key to the three species now known from Hubei is provided here.

#### Key to species of *Zingiber* from Hubei

1. Peduncle erect, 10–30 cm, robust ..... *Z. officinale*
1. Peduncle usually less than 10 cm, slender, sometimes to 17 cm but then not erect ..... 2
2. Corolla purple, lateral staminodes 0.1–0.4 × 0.2 cm, connective appendage ca. 2.2 cm long ..... *Z. zhuxiense*
2. Corolla yellow, lateral staminodes ca. 1.3 × 0.4 cm, connective appendage ca. 1.0 cm long ..... *Z. mioga*

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