

Tacca ampliplacenta (Taccaceae), a new species from Yunnan, China

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Tacca ampliplacenta L. Zhang & Q.-J. Li *sp. nova* (Taccaceae) is described and illustrated from Yunnan province, China. It is distinguished by the following characters: the petioles, peduncles, and flowers are red wine-coloured instead of dark purple; the bracts are very similar to *T. chantrieri*, but the fruits have different intumescent placentas, which fill the fruit cavity; and the stalk of the infructescence is rich in flexible fibre and very tough. Its flowering period (July–August) is rather late as compared with that of the sympatric *T. chantrieri* (April–June). This phenological difference may play an important role in reproductive isolation between the two species.

Key words: *Tacca*, Taccaceae, new species, taxonomy

Tacca (Taccaceae), a genus with about ten species, has a pantropical distribution. Most of the species are native to tropical Asia, except for *T. parkeri*, which is exclusively South American (Drenth 1972, 1976). China has five species that are mainly distributed from southern to southwest China, with the centre of diversity in the Yunnan and Guangxi provinces (Ling 1985, Ding & Larsen 2000). In this area, *T. chantrieri* is the commonest species and inhabits moist and shaded understorey environments in tropical forests. From 2001, we conducted a series of studies on the reproductive biology and population genetics of *T. chantrieri* (Zhang *et al.* 2005, 2006). During field surveys, a peculiar sympatric species was observed in the southwest of Yunnan province. Afterwards more specimens of it were found to the west of the first locality. Living plants were collected and cultivated in the con-

servation base of the Xishuangbanna Tropical Botanical Garden.

***Tacca ampliplacenta* L. Zhang & Q.-J. Li, *sp. nova* (Figs. 1 and 2)**

Quoad habitum et magnitudinem speciei novae ad T. chantrieri André accedit, sed ab ea differt fructu purpureo (nec viridi vel atro), intus textura placentae et seminibus perfecte farcto (nec cavo), pedunculis mollitis flexilibusque (nec fragilibus) cum pedicellis vinaceis (nec viridibus).

TYPE: China. Yunnan, Cangyuan, Banhong, 23°16'N, 99°02'E, 920 m, growing in dense forest, L. Zhang *et al.* 009 (holotype HITBC; isotype KUN).

ETYMOLOGY. The epithet refers to fruit characters: intumescent placentas filling the fruit cavity.

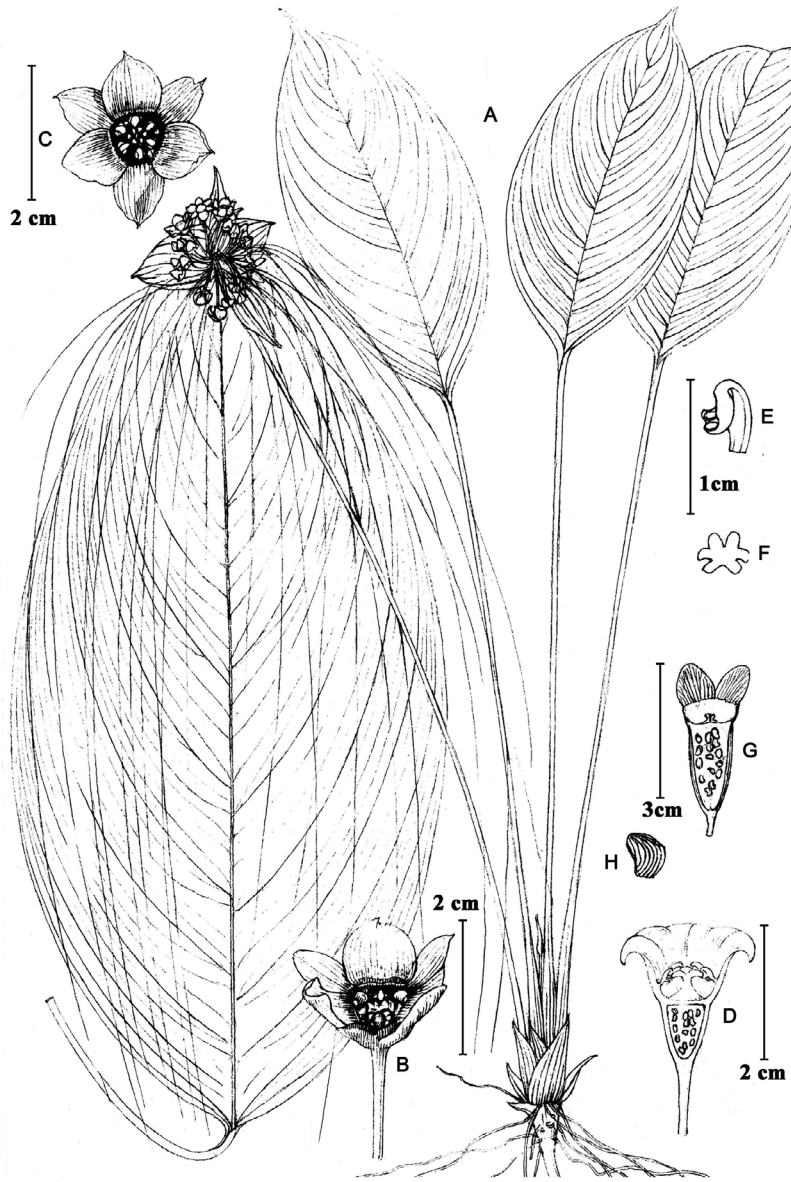


Fig. 1. *Tacca amplipecta* (from the holotype). — A: Habit. — B–C: Flower. — D: Cross section of flower. — E: Androecium. — F: Stigma. — G: Cross section of young fruit. — H: Seed. Drawn by X. L. Wu.

Herbs perennial. Rhizome cylindric, growing vertically, nearly rotund, thick and with mauve apical leaves. Leaves radical, 5–10, petiole erect, 30–50 × 0.7–1.2 cm, red wine-coloured, cylindric, sheathing at lower part; oblong-obovate, 55 cm long, green, shiny, base obtuse with one side auricular-decurrent by 1–2 cm, apex cuneately acuminate; nerves pinnate. Flower stalks emerging from axils, red wine-coloured, cylindric, 40–70 cm long; inflorescence umbels, 1–2, erect, with up to 25 flowers; scape 3–5 cm, fuchsia-red,

triquetrous. Involucral bracts four, two outer bracts lanceolate, oblong-ovate, purple to purple green from centre to margin, 6–8 × 3–4 cm, apex acuminate, with an obtuse base, possessing numerous veins; two inner bracts broad-triangular, colour same as outer bracts, 10–16 × 8–10 cm; filiform bracts 6–26, fuchsia-red. Flowers triangular, buds black-purple, flowers greenish-purple when young, when older fuchsia-red; perianth tube 10–13 mm. Perianth lobes six, reflexed during anthesis and persistent as small

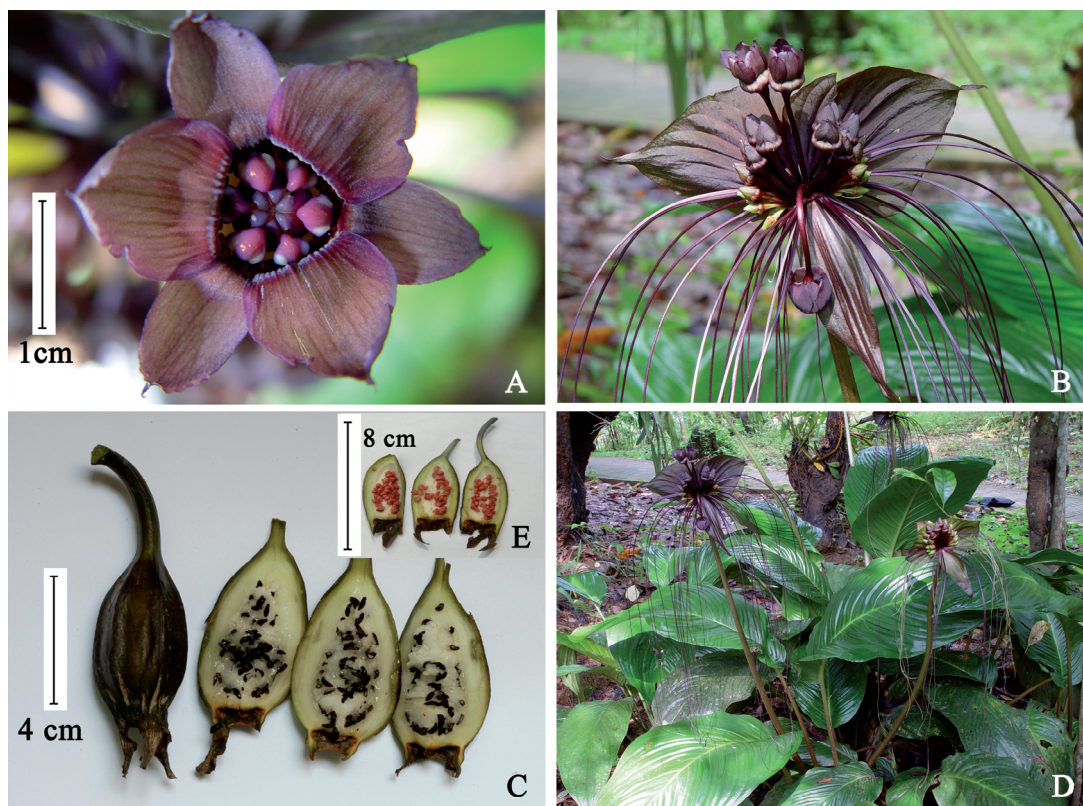


Fig. 2. *Tacca ampliplatenta* (A–D, from paratypes). — A: Flower. — B: Inflorescence. — C: Fruit. — D: Habit. — E: Fruit of *T. chantrieri* (from living plant from the Wild Elephant Valley, Mengyang Nature Reserve, Xishuangbanna (22°10'N, 100°51'E; 760 m alt.)).

remnants afterwards; three inner lobes petal-like, broad-ovate, $1.2 \times ca. 1$ cm, red wine-coloured, apex acute; three outer lobes oblong, 1.2×0.8 cm, red wine-coloured, apex acuminate. Stamens six, inserted at tube base, red, filaments short, thecae hooded, 5×3 mm, with yellow pollen grains. Stigma three, petal-like with two lobes, 3×2 mm, evaginate into anchor shape, fuchsia-red, stamen beset with stigma lobes. Ovaries many, inferior, anatropous triangular coniform, $5\text{--}8 \times 10$ mm, fuchsia-red. Fruit, berries, outer bracts present, black with black peduncle, 4–5 cm; triangular to round in cross section, $4\text{--}6 \times 2\text{--}2.5$ cm, black, fleshy pericarp, pale green inside, side placentae three. Seeds many, reniform, $2\text{--}3 \times 1.5\text{--}2$ mm, brownish red, with many ribs. *Tacca ampliplatenta* is known from the southwest to the west of Yunnan province (Fig. 3). It was first found at the Nangunhe Nature Reserve, Cangyuan county, southwest of Yunnan Province ($23^{\circ}09'$ to $23^{\circ}40'$ N, $98^{\circ}57'$ to $99^{\circ}05'$ E) growing

in a dank valley under dense forest at an altitude of ca. 800 m. Some plant collection has been done in this area, as well as in Yingjiang and Ruili. The species is flowering from early July to late August and fruiting from June to July of the following year. This phenology differs from the sympatric species *T. chantrieri*, which blooms from the end of March to May.

Tacca ampliplatenta can be confused with *T. chantrieri* at the vegetative stage. Although the species have very similar bracts, they are still easy to distinguish: the fruits of *T. ampliplatenta* have intumescent placentas that fill the fruit cavity. Moreover, it has fibrotic infructescence stalks that are hard to break and the petioles and peduncles are red wine-coloured. *Tacca ampliplatenta* is possibly a hybrid between *T. chantrieri* and *T. integrifolia*, because *T. ampliplatenta* is distributed together with *T. chantrieri* in this region and some characters of *T. ampliplatenta* are shared by *T. chantrieri* and *T. integrifolia*.

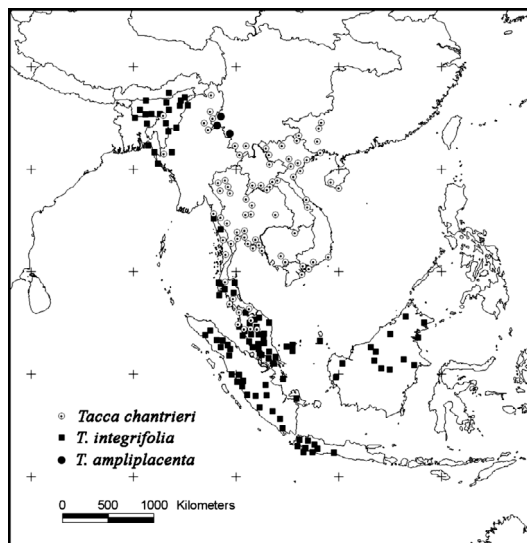


Fig. 3. Distribution map of *Tacca ampliplacenta*, *T. chantrieri* and *T. integrifolia*. Based on data from Drenth (1972).

lia from Medog, Tibet. The internal transcribed spacer (ITS) and *TrnL-F* sequences of *T. ampliplacenta* are the same as those of *T. chantrieri* and *T. integrifolia* (L. Zhang *et al.* unpubl. data). However, the ITS and *TrnL-F* sequences of *T. integrifolia* from Malaysia differ from both *T. chantrieri* and *T. ampliplacenta*, and even from *T. integrifolia* from Medog. Therefore, we suppose that there is a geographical replacement pattern from south to north among these species: *T. integrifolia* (Malaya morph) → *T. chantrieri* → *T. ampliplacenta* → *T. integrifolia* (Indian and Tibetan morph) (Fig. 3). Further studies should consider the evolutionary relationships among these taxa.

ADDITIONAL SPECIMENS EXAMINED (paratypes). — **China.** West Yunnan. Yingjiang: collector unknown 065360 (HITBC); Tao Guo-Da 13348 (KUN, HITBC), 15983 (HITBC); Feng Guo-Mei 1015 (KUN); Yang Zeng-Hong 83-0416 (KUN); Cangyuan: Li Yan-Hui 11469 (KUN, HITBC); Expedition Group of 1986 1133, 1164 (KUN); Tao Guo Da 1992-0032 (XTBG).

Key to *Tacca ampliplacenta* and the morphologically close species

1. Involucral bracts not decussate, two outer bracts opposite, two inner bracts more or less in axils of one of outer; shape of inner involucral bracts resembling rabbit ears 2.
1. Involucral bracts more or less decussate, two inner bracts ovate-oblong 3.
2. Inner involucral bracts elliptic and white *T. integrifolia* (Medog)
2. Inner involucral bracts lanceolate and dark purple *T. integrifolia* (Malay)
3. Fruit triangular to round in cross-section, seeds reniform and easy to separate from fleshy part *T. chantrieri*
3. Fruit triangular, blackish-purple; side placenta intumescent, knaggy, seeds and flesh connected tightly and difficult to separate from fleshy part *T. ampliplacenta*

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References

- Ding, Z. & Larsen, K. 2000: Taccaceae. — In: Wu, Z. Y. & Raven, P. H. (eds.), *Flora of China*, English version, vol. 24: 274–276. Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.
- Drenth, E. 1972: A revision of the family Taccaceae. — *Blumea* 20: 367–406.
- Drenth, E. 1976: Taccaceae. — In: Van Steenis, C. G. G. (ed.), *Flora Malesiana* 1(7): 806. Sijthoff and Noordhoff International Publishers, Alphen Aan Den Rijn, Netherland.
- Ling, P. P. 1985: Taccaceae. — In: Chien, P. & Ting, C. T. (eds.), *Flora of China*, vol. 16(1): 42–54. Science Press, Beijing.
- Zhang, L., Barrett, S. C. H., Gao, J. Y., Chen, J., Cole, W. W., Liu, Y., Bai, Z. L. & Li, Q. J. 2005: Predicting mating patterns from pollination syndromes: The case of sapromyophily in *Tacca chantrieri* (Taccaceae). — *American Journal of Botany* 92: 517–524.
- Zhang, L., Li, Q. J., Li, H. T., Chen, J. & Li, D. Z. 2006: Genetic diversity and geographic differentiation in *Tacca chantrieri* (Taccaceae): an autonomous selfing plant with showy floral display. — *Annals of Botany* 98: 449–457.