

subspecies, and Brühl's figure (t. 126) fits *P. rockii* subsp. *rockii* rather well except for the flower color. The petals of *Paeonia* may change color if specimens are not dried quickly. Haw and Lauener (1990) commented on a specimen, *Gould 132* (K), from Bhutan as "having a large flower with blotched petals. It appears to be closer to [*P. suffruticosa*] subsp. *rockii*, but the leaflets are quite frequently lobed, with up to ca. 5 rather blunt, shallow lobes per leaflet." They also considered this plant as a possible escape from cultivation at a lamasery, and their description fits *P. rockii* subsp. *rockii* very well. On the basis of these findings, it is rather reasonable to say that "*P. moutan* subsp. *atava*" is actually *P. rockii* subsp. *rockii* introduced to Xigaze, Yadong, and nearby Bhutan by Buddhist monks from lamaseries in the Qinling Range.

KEY TO THE SPECIES OF *PAEONIA* IN XIZANG

- 1a. Shrubs; flowers yellow, rarely red-purple.
 - 2a. Carpels 2–4; follicles $< 4 \times 1.5$ cm; petals usually red-blotched at base, rarely red-purple; filaments purple-red; plants < 1.5 m tall; leaf segments and lobes mostly entire *P. delavayi*
 - 2b. Carpels 1, rarely 2; follicles $4.7\text{--}7 \times 2\text{--}3.3$ cm; petals pure yellow; filaments yellow; plants usually 1.5–3.5 m tall; leaf segments and lobes with acuminate teeth . . . *P. ludlowii*
- 1b. Herbs; flowers red, white, or pink.
 - 3a. All leaflets segmented, with segments again segmented, narrowly lanceolate to lanceolate, $3.5\text{--}10 \times 0.4\text{--}1.7$ cm; flowers purple-red *P. veitchii*
 - 3b. Only terminal leaflets 3-segmented, lateral ones not segmented or unequally 2-segmented, narrowly oblong or oblong-lanceolate, $9\text{--}13 \times 1.2\text{--}3$ cm; flowers white or rarely pinkish white.
 - 4a. Carpels densely pubescent; flowers 3 on a stem *P. emodi*
 - 4b. Carpels glabrous; flowers usually solitary *P. sterniana*

Paeonia ludlowii (Stern & Taylor) Hong, stat. nov.
 Basionym: *Paeonia lutea* Delavay ex Franchet var. *ludlowii* Stern & Taylor, J. Roy. Hort. Soc. 76: 217. 1951. TYPE: China. SE Tibet [Kongbo Prov., Miling, Tsangpo Valley], *Ludlow, Sherrieff & Taylor 4540* (holotype, BM).

Deciduous and caespitose shrubs, up to 3.5 m tall. Roots attenuate downward, not fusiform. Stems gray, up to 4 cm diam. Leaves biternate, glabrous on both sides, green above, pale glaucous beneath; petiole 9–15 cm long; leaflets 9, leaf blade $12\text{--}30 \times 14\text{--}30$ cm, lateral 3 leaflets on each side with main petiolules 2–3 cm long, terminal 3 leaflets with main petiolules 5–9 cm long; leaflets nearly

sessile, $6\text{--}12 \times 5\text{--}13$ cm, usually 3-segmented nearly to base; segments $4\text{--}9 \times 1.5\text{--}4$ cm, mostly 3-lobed to middle; lobes $2\text{--}5 \times 0.5\text{--}1.5$ cm, entire or with 1 or 2 teeth, segments, lobes, and teeth all acuminate at apex. Flowers 3 or 4 on each shoot, axillary, 10–12 cm across; pedicels slightly curved, 5–9 cm long; bracts 4 or 5 and sepals 3 or 4, grade into one another; petals pure yellow, spreading, obovate, rounded at apex, $5\text{--}5.5 \times 2.5\text{--}3.5$ cm; filaments yellow, 1.1–1.5 cm long, anthers ca. 4 mm long; disc only 1 mm high, yellow, dentate; carpels mostly single, very rarely 2, glabrous; stigmas yellow. Follicles cylindrical, $4.7\text{--}7 \times 2\text{--}3.3$ cm. Seeds rounded, dark brown, ca. 1.3 cm diam. Flowering late May to early June.

In their description of *Paeonia lutea* var. *ludlowii*, Stern and Taylor (1951, 1953) indicated that the taxon is distinctly different from variety *lutea* and distinguished it by its long, commonly unbranched stems to 8 feet (vs. to 5 feet in var. *lutea*), larger and more open flowers, and up to 2 carpels twice as large as those of variety *lutea*. Upon the examination of plants in five populations in Mailing and Nyingchi counties, as well as five populations of variety *lutea* (= *P. delavayi*), these differences have been confirmed. As shown in Figures 1 and 2, plants of *P. ludlowii* are tall, caespitose, and with larger, pure yellow flowers, yellow filaments, acuminate leaf segments and lobes, and mostly one carpel per flower (more than 97% of the flowers examined have a single carpel and less than 3% have two). Furthermore, *P. ludlowii* produces very large follicles that contain the largest seeds in the genus. In contrast, plants of *P. delavayi* are not caespitose and have much shorter stems, acute leaf lobes and segments, more or less pendulous and smaller flowers on curved pedicels, yellow petals nearly always red-blotched at base, purple-red filaments, and 3 or 4 (rarely 2) much smaller carpels. These differences clearly support the recognition of variety *ludlowii* as a distinct species.

Paeonia ludlowii is a narrow endemic of SE Xizang, where it grows in sparse forests, woods, and thickets in Nyingchi, Mailing, and Lhunze counties at $92.4^{\circ}\text{--}94.8^{\circ}\text{E}$ and $28.4^{\circ}\text{--}29.9^{\circ}\text{N}$. All five populations studied were small in size, and the largest was about 200 m in diameter. Except for the Quenima Village population (*Hong et al. H96020*), which had only four individuals, the other populations consisted of rather dense individuals, and the species was a dominant element in the community. Two factors may explain the compact population with a large number of individuals. First, this species has

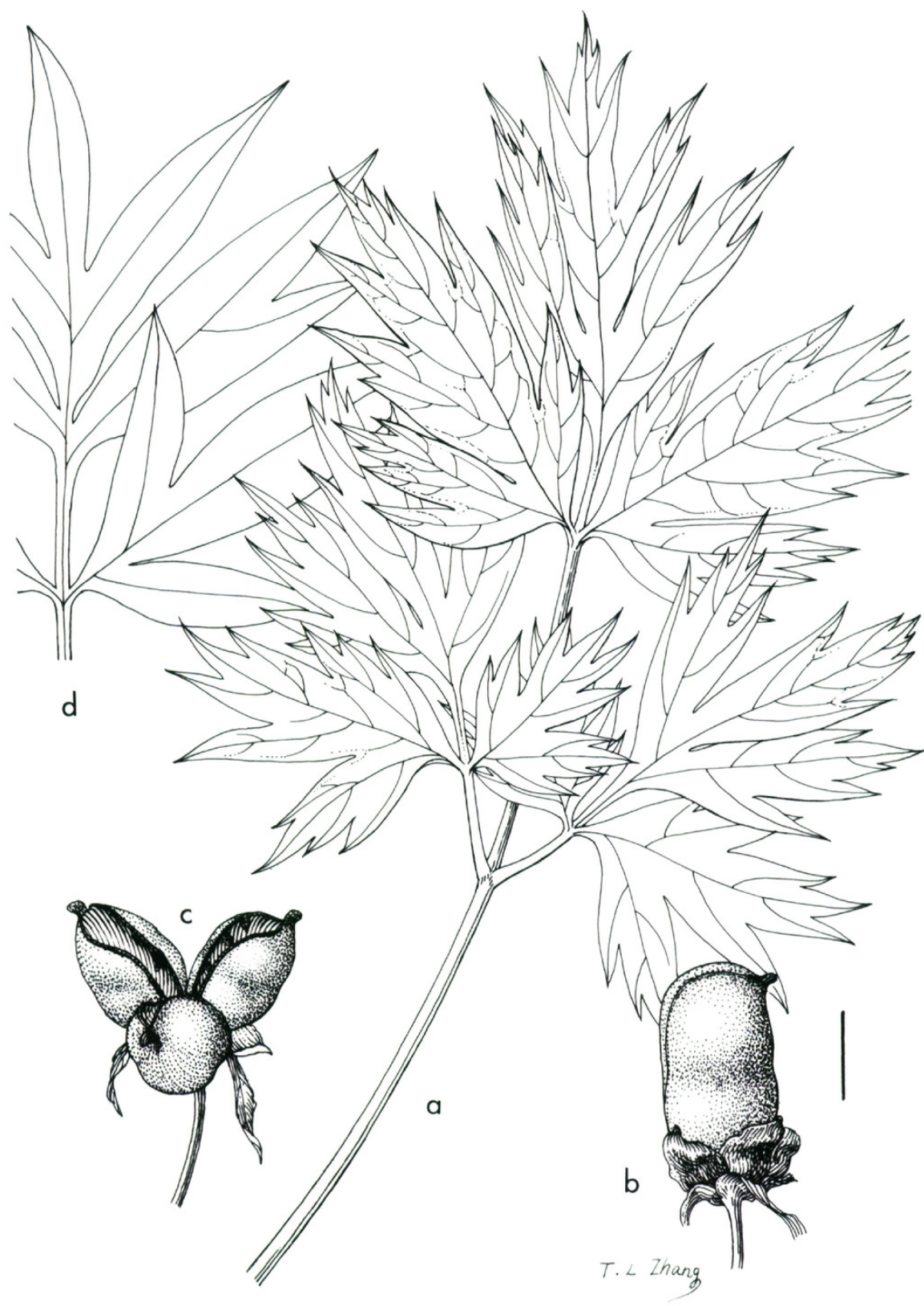


Figure 1. a, b. *Paeonia ludlowii* (Stern & Taylor) Hong. —a. Whole leaf. —b. Fruit of 1 follicle. c, d. *P. delavayi* Franchet. —c. Fruit of 3 follicles. —d. Part of leaf. Scale = 2 cm (drawn by Zhang Tai-li).

a high seed-set, and its seeds appear to have a high germination rate. Nearly 100 seedlings were found in an area of a square meter under a large individual in the Nanyigou population (Hong *et al.* H96030). Second, the seeds of *P. ludlowii* are large

(ca. 1.3 cm diam.) and are not adapted to long-distance dispersal; perhaps they are mostly moved by rats. The species is obligately sexual, and no vegetatively produced individuals or plantlets have been found in any of the populations. More than 20



Hong, Deyuan. 1997. "Paeonia (Paeoniaceae) in Xizang (Tibet)." *Novon a journal of botanical nomenclature from the Missouri Botanical Garden* 7, 157–158.

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