Gentiana lutea L.

Standardized Common Name: Gentian

Other Common Names: Bitter Root, Yellow Gentian

Family: Gentianaceae

Taxonomy: *Gentiana* includes over 350 mostly Asian species of herbs, which are often bitter and medicinal. *Gentiana lutea* ranges from western Europe into Turkey. It is classified with other species in Sect. *Gentiana*, but its floral characters are unique, separating it from all other members of the genus. Hybridization with related species is known but uncommon.

Description: Perennial herb with vertical rhizome and long taproots. Rhizome branched or unbranched, with ring-shaped stem scars, often with fibrous remains of leaf bases on upper portion. Roots to 0.5(–1) m long, (0.5–)1–2.5(–4) cm in diameter, longitudinally wrinkled. Stem 0.5–1.5 m high, thick, unbranched. Leaves in basal rosettes and opposite; basal and lower cauline leaves petiolate with short thick petioles, upper leaves often sessile with somewhat clasping bases; lower leaves largest, 7–20(–30) cm long, elliptical to lanceolate or ovate, yellowish-green, glaucous; base tapering; apex acute to obtuse; underside with 5–7 prominent parallel veins. Inflorescences axillary and terminal, cymose. Calyx tubular, 10–15 mm long, irregularly (2–)5-toothed, split down one side; corolla to >5 cm in diameter, star-shaped with short tube and 5(–9) long spreading lobes, yellow to orange-yellow, often with brown spots, or rarely red; stamens as many as corolla lobes, filaments fused basally to corolla and sometimes fused into a tube, anthers elongated; ovary 1-locular, style 10–15 mm long, stigmas 2. Fruit an ovoid capsule, 20–25 mm long; seeds numerous, brown.

Parts in Commerce: Rhizome and roots, dried slowly

Identification:

- (0.5–)1–2.5(–4) cm in diameter, usually long but cut into segments of several cm before drying; curved or bent, branching occasionally
- Outside brown to yellowish brown; bark brownish to yellowish or reddish brown, rather thick; central portion inside yellowish or orange-brown (white when fresh; presence of orange color indicates properly prolonged drying)
- Upper portion (rhizome) has ring-shaped scars; crown at top is thickened (sometimes to 8 cm in diameter) and bears scaly remains of leaf bases
- Roots have deep longitudinal wrinkles that sometimes curve around root giving a twisted appearance
- Almost cylindrical in general shape, slightly flattened, but very irregular in cross-section due to wrinkles
- Fracture tough and pliable, becoming brittle when thoroughly dry
- Root cross-section shows narrow cork layer, typically 4–6 cells thick; broad ring of parenchyma (pericycle); narrow ring of phloem; conspicuous dark brown layer of cambium cells; large xylem region consisting mostly of parenchyma with few large vessels, not clearly radiate (more radiate near cambium)
- Rhizome cross-section shows cork layer containing collenchyma; cortex; phloem; cambium; xylem (appearing weakly radiate outside, near cambium, but less so near pith); central pith
- Odor unpleasant, heavy, sweet, characteristic
- Taste initially sweet, then strongly bitter

Adulterants: Several other species of *Gentiana* may be found as substitutes; all contain similar bitter principles and have been used medicinally in their own right. The European species *G. purpurea* L., *G. punctata* L., and *G. pannonica* Scop., which have been most commonly found in European material, are all classified with *G. lutea* in Sect. *Gentiana*, but all have smaller roots and rhizomes. If *G. lutea* is to be collected after three years' growth, as is desirable, the larger portions of the rhizomes ought to be at least 2 cm in diameter. The crowns of *G. purpurea* often produce 8–10 stems, giving a highly branched appearance to the upper end of the rhizome, whereas *G. lutea* produces only 1–4 stems; the rhizomes of *G. pannonica* are said to have few ring-shaped wrinkles.

Veratrum album L. (Liliaceae or Melanthiaceae), which is poisonous, appears similar to gentian before flowering, although the leaves are alternate rather than opposite. Several illnesses due to accidental use of *Veratrum* in homemade gentian wine have been reported in recent years, and historical literature mentions it as a contaminant in commercial gentian. The roots are easily differentiated from those of gentian: they are whitish inside and have a conspicuous endodermis enclosing the central vascular tissue, which contains very large xylem vessels alternating with phloem patches. The outer portion of the cortex contains irregular air spaces.

References:

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