

Hydrastis canadensis L.

Standardized Common Name: Goldenseal

Other Common Names: Indian Paint, Eye Balm, Eye Root, Ground Raspberry, Jaundice Root, Orange Root, Wild Curcuma, Wild Turmeric, Yellow Puccoon, Yellow Root

Family: Ranunculaceae or Hydrastidaceae

Taxonomy: *Hydrastis canadensis* is the only species in its genus, which is distinct enough that it is often placed in a family of its own. It is endemic to woodlands of eastern and central North America.

Description: Rhizomatous perennial herb. Rhizome horizontal, to 6 cm long, (2–)6–10(–13) mm in diameter, knotted, sometimes branching, yellow; upper surface with numerous circular stem scars, lower surface with numerous slender roots to 30 cm long. Leaves petiolate, arising singly from rhizome, or cauline with 2 leaves per flowering stem; blade suborbicular, palmately lobed, 6–25 cm broad, reaching full size after flowering; lobes (3–)5–7(–9), ovate, with acute apices; base cordate; margins biserrate. Flower solitary, white, 1–2 cm in diameter; sepals 3 (2–4), rapidly falling off at time of flowering, 3.5–7 mm long; petals absent; stamens numerous, white, showy, 4–8 mm long; gynoecium of 5–20 separate carpels. Fruit an aggregate of berrylike drupes, bright red at maturity, 5–8 mm long.

Parts in Commerce: Rhizome with roots

Identification:

- Rhizome to 6 cm long; diameter 2–8 mm when dried
- Simple or occasionally branching
- Surface knotted, rough, with closely spaced rings and often with longitudinal wrinkles when dried
- Cup-shaped stem scars closely spaced on upper part
- Lower part with many slender roots; roots long, thin, flexible in fresh plant, but brittle and easily broken off when dried
- Rhizome and roots yellow in color, at least internally; surface turns brown upon drying
- Fracture brittle, even; freshly fractured surface may appear mealy or waxy
- Cross-section of rhizome shows several rows of cork cells; cortex with distinct cambial region; ring of narrow radiating xylem bundles separated by wide rays; conspicuous pith
- Numerous small starch grains present in rhizome parenchyma

- Cross-section of root shows thick cortex, small vascular cylinder with 4-wedged wood
- Odor characteristic, unpleasant
- Taste bitter, irritating, inducing salivation

Adulterants: Literature indicates that *H. canadensis* could be adulterated with *Berberis/Mahonia* species, *Coptis groenlandica* L., *C. trifolia* (L.) Salisb., or *Xanthorhiza simplicissima* Marshall, all of which share a yellowish color due to the presence of berberine, or other species with a similar color. Those that contain berberine will taste bitter. Whole material of *H. canadensis* is easily distinguished by size, shape and color of the rhizome or root. Cut material of *H. canadensis* may be recognized by the diameter (<1 cm), color (parenchyma bright yellow, not brownish or reddish), and gross anatomy (surface rough, irregular, with remains of stem scars; pith large; wood with wide parenchyma rays separating narrow xylem rays). These features are unlike those of other berberine-containing species. Microscopic anatomy has also been found useful: thick-walled fibers and sclereids are present in possible adulterants, but not in *Hydrastis*.

References:

Ford BA. *Hydrastis*. In: Flora of North America Editorial Committee (eds.), *Flora of North America*. Vol. 3. New York, NY: Oxford University Press; 1997:87–88.

Lloyd JU, Lloyd CG. *Drugs and Medicines of North America*. Vol. 1. Cincinnati, OH: Robert Clarke & Co.; 1884–85. [Reprinted in *Bull Lloyd Lib*. 1930;29.]

Upton R, ed. *Goldenseal Root. Hydrastis canadensis. Standards of Analysis, Quality Control, and Therapeutics*. Santa Cruz, CA: American Herbal Pharmacopoeia; 2001.