

Actaea racemosa L.

Standardized Common Name: Black Cohosh

Other Common Names: Black Snakeroot, Bugbane, Macrotys, Rattleroot, Rattleweed

Family: Ranunculaceae

Parts in Commerce: Rhizome with roots

Identification:

- Rhizome large, clumpy; to 15 cm long, 1–2 cm broad when dried
- Upper surface packed with short branches bearing undeveloped buds or cup-shaped leaf and stem scars, about 1 cm thick
- Lower surface bearing many long narrow roots; when dried, roots are brittle and easily break off
- Surface dark brown, with bud scale scars in the shape of incomplete rings around branches
- Young buds pinkish white
- Fresh rhizomes whitish inside, turning pink and later grayish upon immersion in ethanol, darkening upon exposure to air; when dried, non-vascular tissues turn dark, vascular bundles remain pale
- Fracture very hard
- Rhizome oval to almost round in cross-section: shows thin cork layer; numerous long narrow vascular bundles usually extending most of the distance between cork and pith, separated by broader rays; and large central pith
- Roots 8–20+ cm long, 1–2.5 mm in diameter (rarely reported to reach 5 mm in diameter), brittle and easily broken when dried
- Root when fresh circular in cross-section, showing central vascular cylinder 0.8–1.3 mm in diameter with (2–)3–4(–6) thick wedge-shaped xylem bundles in all but the smallest roots
- When dried, larger roots may appear angular in cross-section due to shrinkage of tissues around the conspicuous xylem bundles

Cultivated specimens of *A. racemosa* with very different gross rhizome morphology have been observed; in this form, the rhizome is up to 0.5 m long, straight and cylindrical, with several cm between branches; bud-bearing branches are likewise longer and extended outward from the main rhizome. While these plants may be genetically unusual, it is reasonable to suppose that plants cultivated under shade in loose soil will in general grow more expansively than wildcrafted plants that grew in rocky soil filled with tree roots. The cross-section of the rhizome and root should be similar.

Adulterants: Several related species are potential substitutes. The general form of the vascular tissue of the rhizome can be observed with the naked eye or a hand lens in fractured material, and that of the roots with a hand lens or dissecting scope.

A. pachypoda Elliott

- Range overlapping that of *A. racemosa*
- Plant smaller than *A. racemosa*; rhizome <1 cm thick, with fewer stem scars
- Vascular bundles of rhizome few, irregularly spaced, usually <1 mm long
- Roots <2 mm in diameter when dried; vascular cylinder about 0.5 mm in diameter
- Wedges of secondary xylem in roots absent or inconspicuous

A. podocarpa DC. (*C. americana* Michx)

- Range very limited
- Vascular bundles irregularly spaced near outside of rhizome, rounded rather than elongated (length usually less than twice width)
- When dried, fractured rhizome has darkened pith often with an irregular yellow area in center, which is rare in *A. racemosa*
- Vascular tissue of root smaller and less developed; wedges of secondary xylem absent or inconspicuous

A. rubra (Aiton) Willd.

- Native to Western United States
- Rhizome over 1 cm thick, with conspicuous ring of often broad vascular bundles; large triangular fiber bundles may be seen outside the vascular tissue if material is stained
- Roots thick, up to 5 mm in diameter; cortex narrow, vascular cylinder occupying most of root
- Root xylem consists of 3 very large, conspicuous wedges

A. cimicifuga L. (*C. foetida* L., including *A. simplex* (DC.) Wormsk. ex Prantl)

- Most commonly employed Asian species, sold with two other species as Chinese Cimicifuga, may be mistakenly cultivated under the name of *A. racemosa* in North America
- Vascular bundles widely spaced, very narrow, often <1 mm long
- Root vascular cylinder smaller and less developed, with secondary xylem wedges absent or inconspicuous

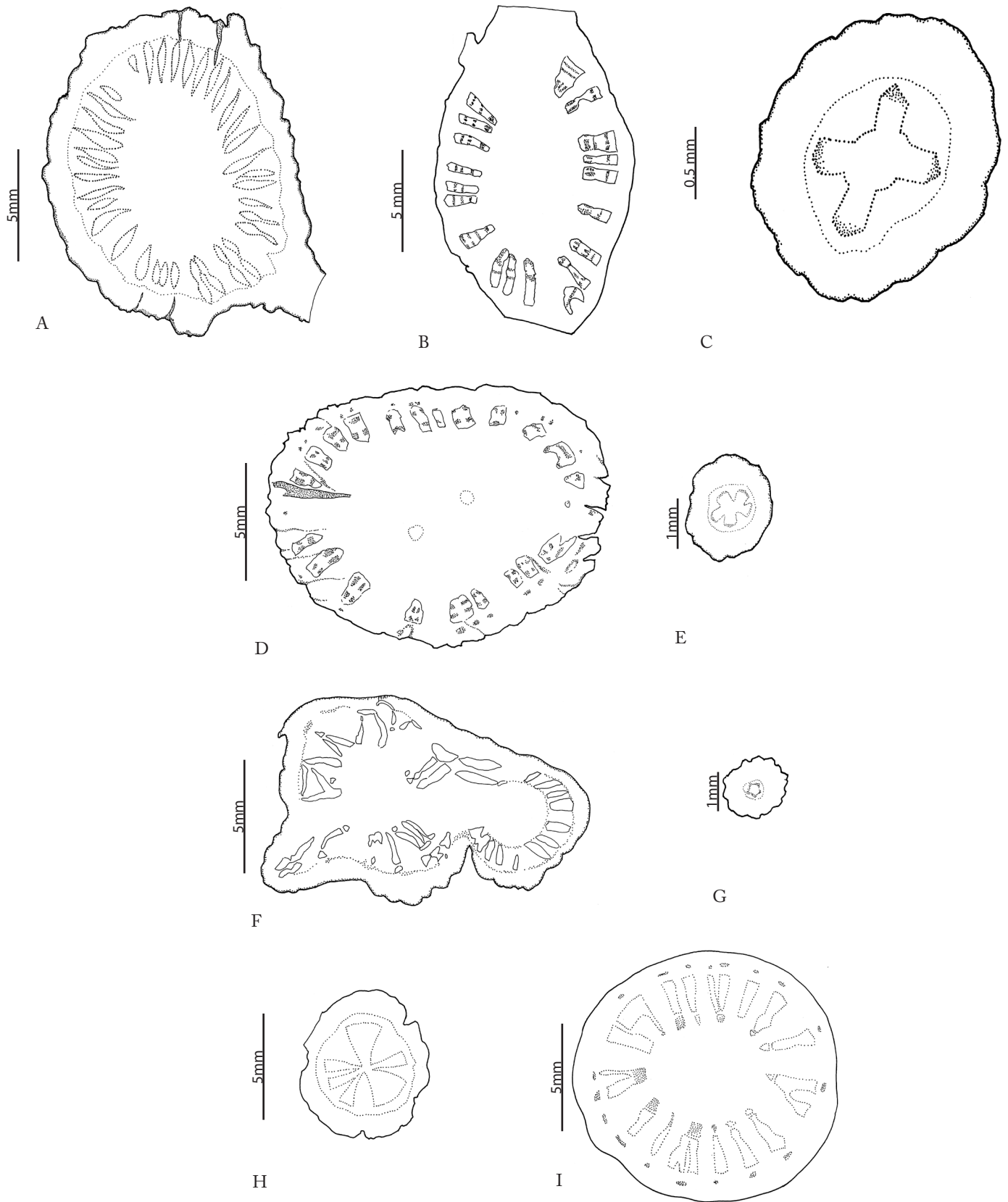


Figure 2: a–c, *Actaea racemosa*, cross-sections of rhizome, atypical cultivated rhizome, and root; d–e, *A. podocarpa*, cross-sections of rhizome and root; f–g, *A. pachypoda*, cross-sections of branching rhizome and root; h–i, *A. rubra*, cross-sections of root and rhizome.

Taxonomy: *Actaea* is native to North America and Eurasia, especially east Asia. It has been divided into two genera: *Cimicifuga* included about two dozen species with dry fruits, while *Actaea* included about eight species with fleshy fruits. Black cohosh belongs to the former group and is most commonly known as *Cimicifuga racemosa* (L.) Nutt. However, the close resemblance between *Cimicifuga* and *Actaea*, as well as molecular evidence that the latter genus arises from the former, justifies recombining the two, and *Actaea* as the older name has priority. About a dozen synonyms exist, of which several may be encountered in older literature, including *A. monogyna* Walt., *Botrophis serpentaria* Raf., *Cimicifuga serpentaria* Pursh, *Macrotrys actaeoides* Raf., *Macrotrys* [sic] *racemosa* Sweet, and *M. serpentaria* Eaton.

Description: Rhizomatous perennial herb. Rhizome horizontal, large; upper side with upturned buds and rounded stem and petiole scars, lower side with long slender roots. Leaves mostly basal, 2–3-ternately or ternate-pinnately compound, often over 0.5 m wide; lateral leaflets ovate to obovate, 4–12 cm long; terminal leaflets 3-lobed with 3 basal veins, to 15 cm long, breadth often equaling or exceeding length; bases cuneate to shallowly cordate; apices acute; margins dentate to serrate; surface dark green, glabrous or nearly so. Inflorescence on peduncle to 2 m high, with (2–)4–9 racemose branches; branches 10–60 cm long, many-flowered. Flowers white; sepals 4(–5), quickly lost; petals variable in number, ca. 3 mm long; stamens numerous, white, showy, 5–10 mm long; gynoecium of 1 carpel. Fruit a follicle, 5–10 mm long, ovoid, slightly flattened; seeds 8–10.

References:

Applequist WL. Rhizome and root anatomy of potential contaminants of *Actaea racemosa* L. (black cohosh). *Flora*. 2003;198:358–365.

Compton JA, Culham A, Jury SL. Reclassification of *Actaea* to include *Cimicifuga* and *Souliea* (*Ranunculaceae*): phylogeny inferred from morphology, nrDNA ITS, and cpDNA *trnL-F* sequence variation. *Taxon*. 1998;47:593–634.

Lloyd JU, Lloyd CG. *Drugs and Medicines of North America*. Cincinnati, OH: Robert Clarke & Co.; 1884–85. [Reprinted in *Bull Lloyd Lib*. 1931;30.]

Radford AE, Ahles HE, Bell CR. *Manual of the Vascular Flora of the Carolinas*. Chapel Hill, NC: University of North Carolina Press; 1968.

Ramsey GW. Morphological considerations in North American *Cimicifuga*. *Castanea*. 1987;52:129–141.

Ramsey GW. *Cimicifuga*. In: Flora of North America Editorial Committee, eds. *Flora of North America*. Vol. 3. New York, NY: Oxford University Press; 1997:177–181.