

Smilax aristolochiifolia Mill., *S. febrifuga* Kunth, *S. regelii* Killip & C. V. Morton

Standardized Common Name: Sarsaparilla

Other Common Names: The listed species are the three most commonly sold as Sarsaparilla, although several others may be found in trade. As presently understood, *S. aristolochiifolia* is the source of Mexican Sarsaparilla, also called Gray or Vera Cruz Sarsaparilla. *Smilax febrifuga* is the source of Ecuadorian and Peruvian Sarsaparilla, also called Guayaquil Sarsaparilla. *Smilax regelii* is the source of Honduran Sarsaparilla, also called Brown or Jamaican Sarsaparilla and additionally produced in Guatemala and British Honduras, where *S. aristolochiifolia* also occurs. The species of *Smilax* have been and remain very poorly understood, and older literature often attributes material from the regions mentioned above to different species than those named here.

Family: Smilacaceae

Taxonomy: *Smilax* includes perhaps 300 widely distributed species of dioecious vines. Their taxonomy is not well understood, as herbarium material from many regions is limited, often sterile, and vegetatively variable within species. Many species have been named repeatedly, and by chance an unusual number of the names published for important New World species were illegitimate later homonyms. Synonyms of *S. aristolochiifolia* include *S. medica* Schlttdl. & Cham. (by which it was commonly known in older literature) and *S. ornata* Lem. Synonyms of *S. regelii* include *S. grandifolia* Regel, *S. ornata* Hook [non Lem.], and supposedly *S. officinalis* Kunth, which more likely is referable to the South American *S. longifolia* Richard.

Description: Long vines with long narrow roots; roots sometimes to 3 m long, rarely branching, arising from a short thick knotty rhizome. Stems and branchlets bearing numerous sturdy prickles to 1 cm long along internodes. Stipules modified into tendrils. Leaves alternate, ovate to oblong, quite variable in size (sometimes reaching 30 cm in length); major veins curving, parallel; petioles and undersides of leaves often bearing prickles. Flowers unisexual, plants dioecious. Inflorescences lateral in leaf axils, umbellate. Flowers with 2 subequal whorls of 3 tepals, usually 6 stamens (with long anthers, filaments shorter than anthers) or 1 3-loculed ovary. Fruit a berry.

S. aristolochiifolia: Stems and branchlets weakly 4-angled or subcylindrical. Major leaf veins usually 7; leaf apex rounded to obtuse, often short-acuminate; leaf base cordate to hastate. Tepals 3–4 mm long. Fruits red, <1 cm in diameter.

S. regelii: Stems and branchlets sharply 4-angled, branchlets sometimes shallowly winged. Major leaf veins 5–7; leaf apex acuminate to rounded and mucronate; leaf base more or less cordate or hastate. Tepals 3.5–5 mm long. Fruits black, to 1.3 cm in diameter.

S. febrifuga: Stems and branchlets usually not conspicuously angled, but with longitudinal striations. Leaves narrowly or broadly ovate to elliptical. Major leaf veins 3 (5 in some large leaves); leaf apex acuminate; leaf base shallowly cordate or rounded to tapering, often somewhat asymmetrical. Tepals 4–5 mm long. Fruits orange, 1–1.4 cm in diameter, somewhat ovoid.

Parts in Commerce: Roots

Identification:

- Roots (1–)2–5(–6) mm in diameter, very long if not cut, seldom branching; traditionally roots were cut into pieces over 0.5 m long and sold wrapped in cylindrical bundles
- Outer surface longitudinally wrinkled, sometimes bearing small rootlets
- In cross-section, contains epidermis; at least 1 layer of distinctive cells (“exodermis”) beneath epidermis; cortex; endodermis; vascular cylinder with numerous clusters of phloem cells and groups of 1 or a few xylem vessels in a ring surrounding a central pith of thin-walled cells
- Dividing line between vascular tissue and pith is wavy
- Vascular tissue yellowish and porous; pith pale to almost white
- Fracture of central portion usually tough and fibrous, sometimes short
- Taste mucilaginous and bitter, not very strong

| | S. aristolochiifolia | S. regelii | S. febrifuga |
|---------------------------------|--|-------------------------------|---|
| Color of outer surface | Reddish to pale, grayish brown | Reddish to rich brown | Reddish brown to dark with purple tinge |
| Texture of outer surface | Smooth except for few deep wrinkles; rootlets very few | Wrinkled | Wrinkled |
| Cortex | Pale orange, often mealy | Pale orange to brown, starchy | Reddish to brown, mealy |

Adulterants: A broad variety of adulterants were reported in older literature, including the rhizomes of tropical *Pteris* or other ferns, the rhizomes of *Carex arenaria* L. and *C. hirta* L. (sedges), and the roots of a *Philodendron* and an *Agave*. In India the root of *Hemidesmus indicus* Br. (Asclepiadaceae) may be employed interchangeably with *Smilax*. Potential contaminants are limited to plants producing long, slender, seldom-branched roots or rhizomes. The most important feature to be observed is the presence of a conspicuous pith inside the yellowish ring of vascular tissue containing numerous xylem bundles, as this kind of root anatomy is found only in some monocots, including *Smilax*. Distinguishing features of reported contaminants include the following:

- Roots of dicots, such as *Hemidesmus*, have vascular tissue, not pith, in the central portion of the root.
- Fern rhizomes have complex vascular anatomy, often containing numerous bundles in one or more rings or in other patterns. *Pteris* has at least one unbroken ring of vascular tissue, not separated into distinct bundles, and often a protrusion of xylem into the central pith or a complete second ring or spot of xylem inside the first. Bands of dark, thick-walled sclerenchyma may also be present; there is no endodermis.
- *Agave* roots have a ring of parenchyma several layers thick between the endodermis and the beginning of the vascular tissue; they contain large crystals that may be observed under a microscope.
- *Philodendron* roots contain, inside the epidermis, one layer of exodermis and one layer of hypodermis (a ring of small cells with very thick walls); lines of large clear secretory cells are present, at least near the vascular bundles; they also contain large crystals that may be observed under a microscope.

- *Carex* rhizomes have a broad cortex occupying most of the diameter; often most of the cortex is spongy with conspicuous air spaces. The small vascular cylinder is surrounded by a layer of thick-walled cells that resembles an endodermis, but can be several cells thick. Vascular bundles are arranged in a circle around a pith; individual bundles usually have a circular pattern, with a ring of xylem around a central spot of phloem.

The inclusion of excessive rhizome or aerial stems of *Smilax* is also a form of adulteration.

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