Common Name: SWEET PINESAP

Scientific Name: *Monotropsis odorata* Schweinitz in Elliott

Other Commonly Used Names: Carolina beechdrops

Previously Used Scientific Names: *Schweinitzia odorata* (Schweinitz) A. Gray

Family: Ericaceae (heath) or Monotropaceae (pygmy pipe)

Rarity Ranks: G3/S1

State Legal Status: Threatened

Federal Legal Status: none

Federal Wetland Status: none

Description: Perennial **herb**, lacking chlorophyll, parasitic on underground fungi associated with roots of trees. **Stems** 1 - 3 inches (3 - 8 cm) tall, fleshy, smooth, and hairless; red, purple, pink, or brown; usually in clusters, at first curved, becoming erect with age. **Leaves** tan, papery, scale-like, triangular, less than ⅜ inch (4 - 8 mm) long. **Flower clusters** extremely sweet-fragrant, nodding at the top of the stem. **Flowers** less than ⅜ inch (4 - 9 mm) long, bell-shaped; with 5 white-tipped, purple **petals** united for almost half their length, and 5 tan, separate, papery **sepals** nearly as long as the petals. **Fruit** a berry less than ⅜ inch (4 - 8 mm) wide, purplish, round, nodding.

Similar Species: Pine-sap (*Monotropa hypopithys*) has yellow, pink, or red stems; stems and flowers are hairy; the topmost flower has 5 petals and 5 sepals, the other flowers have 4 petals and 4 sepals; petals are completely separate from each other. Indian-pipes (*Monotropa uniflora*) have white stems with a single white flower at the top; its petals are separate.

Related Rare Species: None in Georgia.

Habitat: Mixed pine-hardwood or chestnut oak-dominated forests with dry, acidic soil, often with mountain laurel, rhododendron, and blueberry.

Life History: Sweet pinesap is a perennial herb. It sends up stems in the fall, reaching about ¾ of its full size; it then completes its growth and flowers the following spring. Getting that head start on growth is an advantage, allowing it to bloom earlier than other spring-flowering plants and to be among the first flowers to attract pollinators. The advance growth comes with a price, though, increasing the amount of time that the plants are available to hungry insects, birds, and rodents. However, the colorful stems and flowers of sweet pinesap are covered by tan, papery bracts that resemble the dead leaves that cover the ground around the plants. This camouflage largely protects sweet pinesap from plant-eating animals.

Sweet pinesap flowers require cross-pollination in order to set fruit. Their pollen is relatively inaccessible to pollinators, held in tubular anthers with only one opening at the tip. Bumblebees extract the pollen by "buzzing" the anthers: they grasp the flower and rapidly move their indirect flight muscles (not their wings), causing the flower and anthers to vibrate and release their pollen. Some of this pollen is taken back to the bumblebee's nest but some is carried to the next flowers the bumblebee visits. Sweet pinesap seeds are dispersed by small animals.

Sweet pinesap is a non-photosynthetic plant; it lacks chlorophyll and therefore the means to manufacture carbohydrates. It is an epiparasite, meaning that it grows on a fungal parasite (*Hydnellum*, a basidiomycete) which itself is attached to the roots of a green, photosynthesizing plant. The fungus extracts carbon from the photosynthetic plant, and sweet pinesap extracts carbohydrates from the fungus.

Survey Recommendations: Surveys are best conducted during flowering (February–April) and fruiting (May–June). Plants are often hidden under leaf litter or fallen pine needles; the sweet,

cinnamon-like fragrance of the flowers can be smelled from some distance and used to locate the hidden plants.

Range: Georgia, Alabama, South Carolina, North Carolina, Tennessee, Virginia, West Virginia, Kentucky, Maryland, and Delaware.

Threats: Conversion of habitat to pine plantations and developments. Fire suppression. Foot traffic through populations.

Georgia Conservation Status: Once known from 11 sites, only 3 populations have been recently seen, all 3 on state park or National Forest land.

Conservation and Management Recommendations: Protect sites from clearcutting and conversion to pine plantations. Direct foot trails away from sites. Apply prescribed fire.

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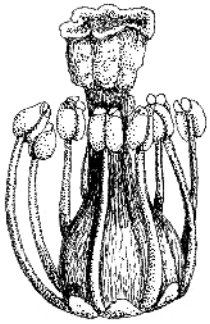
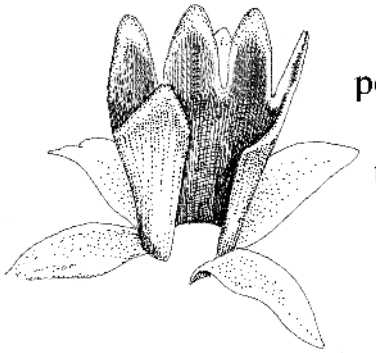
Date of Species Account:
L. Chafin, June 2008: original account
K. Owers, Feb. 2010: added pictures

SWEET PINESAP
Monotropsis odorata

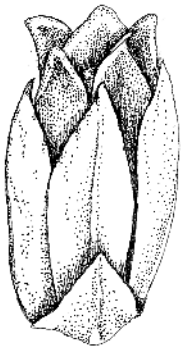
flower



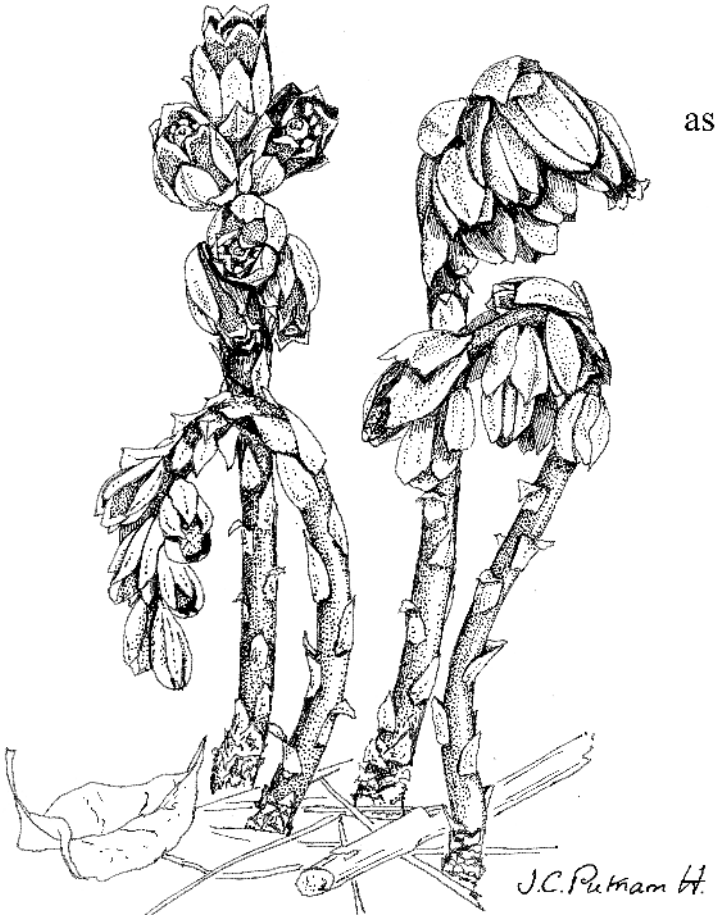
pistil surrounded by stamens

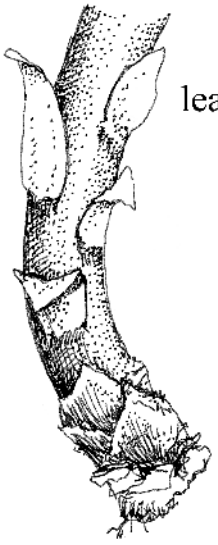


petals united almost half their length



sepals almost as long as petals





leaf