

Figure 3. Air potato (a) vines are smooth and twine counterclockwise, with (b) alternate heart-shaped leaves with major veins all arising from the same point. Flowers are rarely present in North America but may be (c) whitish-green or (d) tinged pink. Two types of bulbils occur in the Southeast USA: (e) brown with rough skin and small bumps or projects and (f) tan with smoother skin and fewer bumps. (a: Katja Schulz, iNaturalist.org CC BY 4.0; b: John Fraser, iNaturalist.org CC BY-NC 4.0; c,f: Karen Brown, University of Florida, Bugwood.org CC BY-3.0 US; d: Shiwalee Samant, iNaturalist.org CC BY-NC 4.0; e: Iserra, iNaturalist.org CC BY-NC 4.0)

Roots

Air potato grows from persistent subterranean tubers that resemble small, oblong potatoes typically 2–6 in or 5–15 cm in diameter, though some can be longer depending on soil conditions. Fleshy, white roots also grow from bulbils that fall to the ground and sprout new vines in spring.

STEMS AND LEAVES

Vines grow up to 98 ft (30 m) long, blanketing trees and surrounding vegetation (**Fig. 4**). Vines are smooth, rounded, and twine counterclockwise (from right to left; **Fig. 3a**). Leaves are alternate (**Fig. 3a**), smooth-margined, heart-shaped, attached by long petioles, and up to 8 in (20 cm) long and nearly as wide. Leaf veins are deep; all arise from the same point at the point of petiole attachment, and all terminate at the same point at the pointed tip of the leaf (**Fig. 3b**).

FLOWERS

While flowers are rarely present in North America, it is not uncommon to see the occasional vine in flower. Male and female flowers occur on separate plants (dioecious), but only female flowers have been observed in the invaded range. Flowers occur on small hanging spikes arising from leaf axils. Each flower is fragrant, small, and either pale green to white (**Fig. 3c**) or tinged in pink (**Fig. 3d**).

FRUITS, SEEDS, AND VEGETATIVE PROPAGULES

Sexually produced fruits are 3-winged capsules that produce tiny, partially winged seeds. However, yam fruits are extremely rare in the USA. If ever produced, they are sterile; seeds have not been observed in North America. Air potato produces vegetative propagules called bulbils (aerial tubers) that arise from leaf axils. These resemble small potatoes and give the plant its common name of “air potato”. Bulbils can vary markedly in their appearance but are typically round or angled, and $\frac{1}{2}$ –5 in (1¼–13 cm) across. There are two bulbil morphotypes in the southeastern USA: brown and tan. Brown bulbils have dark brown skin and a rough surface with numerous rounded bumps or small projections (**Fig. 3e**). Tan bulbils have tan skin with a relatively smooth surface and fewer rounded bumps (**Fig. 3f**).

ECOLOGY

While air potato can reproduce by seed in its native range, it reproduces exclusively vegetatively in the USA. Air potato sprouts from subterranean tubers and bulbils in spring. Vines may grow outwards or climb into the canopy by twining around trees. They can grow up to 8 in (20 cm) per day in summer and up to 98 ft (30 m) long per season. Up to 200 bulbils are produced per plant throughout summer

and autumn. These fall to the ground in autumn and winter months and may be carried long distances by water or on machinery and equipment. Vines die back in winter with colder temperatures and re-grow from tubers or bulbils the following spring. Dead stems often remain strongly attached to nearby vegetation or structures and serve as an attachment surface for new vine growth the following season.

HABITAT

Air potato can be found growing in moist, mesic, and/or hardwood forests. It is frequently found in disturbed areas, forest gaps, and along roadsides (Fig. 4) and is less common in coastal areas and pine forests. It grows best where winter temperatures remain above freezing.

NOTES

Some varieties of air potato are edible and cultivated as a food crop, especially in West Africa. Varieties in the USA tend to be bitter, and some consider them to be poisonous unless thoroughly soaked and boiled.

SIMILAR SPECIES

There are five additional species of yam in the genus *Dioscorea* established in North America. The native Florida yam (*D. floridana*) and wild yam (*D. villosa*) have rhizomes instead of subterranean tubers and neither produces aerial bulbils. The three other exotic *Dioscorea* species all grow from subterranean tubers and produce aerial bulbils, though each species has subtle to obvious differences to air potato. All five *Dioscorea* species are described in greater detail in **Table 1**, along with key characteristics that can be used for differentiating them from air potato and from each other. The exotic kudzu (*Pueraria montana*) is not related to air potato and has many more obvious differences. It is included in **Table 1** because it is frequently mistaken for air potato from a distance.

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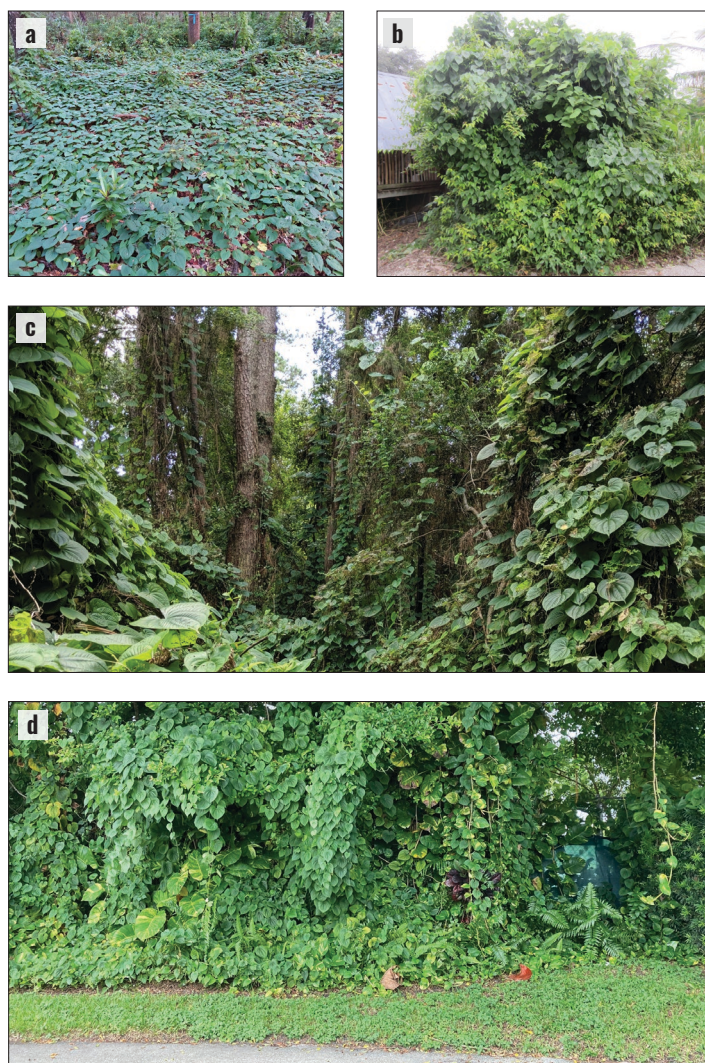


Figure 4. Air potato growing (a) in a forest clearing, (b) over other vegetation in an abandoned lot, (c) in a forest, and (d) along a roadside (a: Adam Pitcher, iNaturalist.org CC BY-NC 4.0; b: Dvdksrrw, iNaturalist.org CC BY-NC 4.0; c: Irvin Louque, iNaturalist.org CC BY-NC-ND 4.0; d: Jade Fortnash, iNaturalist.org CCO)

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Table 1. Key traits for differentiating air potato from similar related species established in North America.

SPECIES	SIMILARITIES	DIFFERENCES	PLANT	LEAF	FRUIT/BULBIL
Florida yam <i>Dioscorea floridana</i> Dioscoreaceae Native perennial	Perennial climbing vine; plants dioecious; similar habitat; stems twine counterclockwise; leaves alternate, heart-shaped; small flowers in clusters from leaf axils; fruit and seeds winged	Roots rhizomatous; only grows 3½–13 ft (1–4 m); stems ridged, often reddish; nodes articulate (plant may separate naturally at nodes); leaves sparsely hairy on undersides, only 1¼–4½ in (3–11 cm) long; flower clusters often branched; flowers more yellow; fruit fertile; no bulbils			
Wild yam <i>Dioscorea villosa</i> Dioscoreaceae Native perennial	Perennial climbing vine; plants dioecious; similar habitat; stems twine counterclockwise; leaves alternate, heart-shaped, similar veins; small flowers in clusters from leaf axils, white to pale green; fruit and seeds winged	Roots rhizomatous; only grows 5–30 ft (1½–9 m); stems ridged, often reddish; leaves sparsely hairy on undersides, only 2–4 in (5–10 cm) long, may appear in whorls near vine base; fruit fertile; no bulbils			
Chinese yam <i>Dioscorea polystachya</i> Dioscoreaceae Exotic perennial	Perennial climbing vine; plants dioecious; roots tuberous; invasive with dense, smothering mats; similar habitat; leaves alternate near vine base, some heart-shaped; small flowers in clusters; aerial bulbils tan; seeds winged	Only grows ≤16½ ft (4 m); stems twine clockwise, slightly ridged, may be reddish; leaves only 1¼–4½ in (3–11 cm) long, may grow opposite near vine tips, some 3-lobed with more pointed tip; flowers greenish; fruit fertile; bulbils ¾ in (2 cm) long, small projections on tan bulbils			
Winged yam <i>Dioscorea alata</i> Dioscoreaceae Exotic perennial	Perennial climbing vine; plants dioecious; roots tuberous; invasive with dense, smothering mats; similar size and habitat; leaves heart-shaped, alternate near vine base; small flowers in clusters; aerial bulbils dark brown with small projections; fruit and seeds winged	Roots massive; stems twine clockwise, winged with 4 sides, purple-tinged; leaves opposite at vine tips, narrower with more pointed tips; petioles clasp the stem; flowers greenish; fruit fertile; bulbils more elongate			
Zanzibar yam <i>Dioscorea sansibarensis</i> Dioscoreaceae Exotic perennial	Perennial climbing vine; plants dioecious; roots tuberous; invasive with dense, smothering mats; similar size and habitat; stems twine counterclockwise; leaves alternate near vine base; small white flowers in clusters; aerial bulbils dark brown; fruit and seeds winged	Stems slightly angled; leaves opposite at vine tips, 3–5 lobed, longer and nearly twice as wide; petioles clasp the stem; fruit fertile			
Kudzu <i>Pueraria montana</i> Fabaceae Exotic perennial	Perennial climbing vine; roots tuberous; highly invasive with dense, smothering mats; similar length and habitat; leaves alternate, relatively hairless, similar size; flowers in long clusters	Stems dark brown, rope-like, hairy, twine clockwise; leaves compound, separated into three leaflets; foliage exudes skunky odor when crushed; flowers pink to deep purple; each flower strongly 2-lipped; fruits long, hairy pods			

Photos: Florida yam plant and leaf (Alex Abair, iNaturalist.org CC BY-NC 4.0), fruit (adapted from Jeff Staufferild, iNaturalist.org all rights reserved); wild yam plant (Summit Metro Parks, iNaturalist.org CC BY 4.0), leaf (Derek, iNaturalist.org CC BY 4.0), fruit (dinomama789, iNaturalist.org CC BY-NC 4.0); Chinese yam plant, bulbils (Chris Evans, Bugwood.org CC BY-3.0 US), leaf (James H. Miller, USDA Forest Service, Bugwood.org CC BY-3.0 US); winged yam plant, leaf (Chris Evans, Bugwood.org CC BY-3.0 US), bulbil (Angel D Vega, iNaturalist.org CC BY-NC 4.0); Zanzibar yam plant (Al Kordes, iNaturalist.org CCO), leaf (Jonathan Hiew, iNaturalist.org CC BY-NC 4.0), bulbil (SunGW, iNaturalist.org CC BY-NC 4.0); kudzu plants (Kerry Britton, USDA Forest Service, Bugwood.org CC BY-3.0 US), leaves (James H. Miller & Ted Bodner, Southern Weed Science Society, Bugwood.org CC BY-3.0 US), fruit (bobohog, iNaturalist.org CC BY-NC 4.0)

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ACKNOWLEDGMENTS

The authors thank two anonymous reviewers for providing helpful comments on earlier versions of this publication. This fact sheet was produced by the North American Invasive Species Management Association (NAISMA) with financial support from USDA Forest Service. The layout was designed by Rachel Winston, MIA Consulting.

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SUGGESTED CITATION

Dray, F.A, Jr., and M.B. Rayamajhi. 2025. Air Potato (*Dioscorea bulbifera*): History and Ecology in North America. In: R.L. Winston, Ed. *Biological Control of Weeds in North America*. North American Invasive Species Management Association, Milwaukee, WI. NAISMA-BCW-2025-15-AIR POTATO-P.

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