

Actinidia chinensis J.É. Planchon

Golden Kiwi

Other Common Names: Chinese Soft-Hair Kiwi, Gold Kiwi, Yellow Kiwi.

Family: *Actinidiaceae*.

Cold Hardiness: Although the cold hardiness of this species is not fully defined it is thought to be approximately USDA hardiness zones 7b (7a) through 9.

Foliage: Deciduous, alternate, simple leaves are broadly ovate to cordate with rounded or more frequently cordate bases; leaves are variable in size from 3" to 5" (8") long; margins are entire, but appear to have almost a yellow hollow due to the covering of short yellowish pubescence when young; tips are short acute to emarginate; blades are thickish with lightly impressed pinnate veins above, which are more prominently raised beneath and covered in a yellowish pubescence or flushed red on main veins; the petioles are about a third to half the length of the blade, stout, convex above, pubescent and flushed red; leaves (especially upper surfaces), petioles, and stems become decidedly less pubescent as the season progresses; new growth can be showy.

Flower: Although flowers are morphologically perfect, they are functionally imperfect; male flowers produce a hundred to two hundred anthers, but only a vestigial stigma; female flowers produce only a few nonfunctional anthers and radiating styles; flowers are produced in early to mid-spring from lateral buds in the axis of the first few nodes of the previous year's elongating stems; the 1" to 2" diameter bowl or saucer shaped flowers have five broadly ovate petals which open white and fade to creamy yellow when senescing; flowers are subtended by fuzzy pubescent light brown bracts with hairy or fringed margins; for good pollen set, one male is needed for each three or four female vines and the timing of pollen dispersal needs to be compatible with stigma receptivity; compatible pollinators, as well as suitable pollinizers, need to be identified; flowers are subtended by long yellow-green peduncles that may be flushed red.

Fruit: Oblong to egg-shaped, 3" long, berry-like fruit are produced in abundance on female vines; several improved cultivars for number and quality of their fruit or compatible timing of pollen production have been identified; bearing begins after approximately three or four years for the cultivars; the better cultivars have a roughened yellow-brown epidermis, but are nearly lacking pubescence at maturity, and provide a sweeter fruit than *A. deliciosa*; unlike the green-fleshed *A. deliciosa*, *A. chinensis* is reported to have a light yellowish green, pale yellow, bright yellow, to golden yellow fleshed fruit; fruit mature in late summer to early fall.

Stem / Bark: Stems — stems are long stout whip-like branches that are green with light orangish brown to white-tan lenticels which tend to elongate vertically; new stems are covered in a hairy pubescence; second year stems lose most of the pubescence and turn a dark rich smooth glossy brown with white-gray lenticels which may split vertically as the stems thicken; Buds — imbricate scales are covered in a yellowish to reddish brown fuzzy pubescence; Bark — new bark is green quickly turning a rich brown on second and subsequent years' growth; intermediate age stems have light gray lenticels that fissure to expose the underbark; stout older trunks become a lighter brown color.

Habit: Overall plants are reminiscent of a coarse textured Grapevine (*Vitis sp.*), but lack tendrils, climbing to about 25' via a combination of sprawling of long whip-like stems that twine to varying degrees; vines are medium-coarse to more commonly coarse textured with very rapid growth rates once established.

Cultural Requirements: One authority claimed that essentially Golden Kiwi can be grown about anywhere that Peaches will grow, this may be true of soil and site conditions, but *A. chinensis* is definitely not as cold tolerant as *Prunus persica*; plants are performing well in many locations around the Southcentral USA, Southeastern USA, and Northwestern USA, but the full extent of adaptation is as yet poorly defined; plants appear to respond well to supplemental fertility and water; *Actinidia spp.* are generally not very drought tolerant, and as such need a steady moisture supply; Kiwi should be planted in a sunny spot to encourage fruit production; winter protection of young plants of *Actinidia spp.* is recommended as they are often more susceptible to cold injury than older established individuals; pruning will be needed to maintain plants in bounds; some gardeners prune

these plants back to about 8 to 10 buds per stem each winter.

Pathological Problems: Most pest reports are from China and New Zealand, those present in our region might include rootknot nematodes (*Meloidogyne hapla*) on sandy soils, thrips (*Heliothrips haemorrhoidalis*), and passion vine hopper; crown gall (*Agrobacterium tumefaciens*), *Phytophthora* root rots (*P. cactorum* and *P. cinnamomi*), and oak root fungus (*Armillaria mellea*) can be serious on the roots and crowns, while *Botrytis cinerea* can infest developing flowers and fruits.

Ornamental Assets: Light green new growth that darkens to a lush rich green and the numerous edible fruit on female vines are the primary assets; fruit are also attractive to wildlife; pubescence on the fruit of this taxon is less than that of *A. deliciosa* and *A. chinensis* is reportedly a more prolific fruiter than *A. deliciosa*; reports from Dr. David Creech's group at Stephen F. Austin State University confirm this.

Limitations & Liabilities: Growth is rampant and coarse and can get quickly out of hand; fruiting can be subject to the vagrancies of weather; from a landscape perspective the fruit on female plants can be messy; leaves can look a bit ratty and the habit is irregular by late summer; strong supports are needed for the vigorous vines; unexplained dieback of male pollinizers, which often eventually return from the roots, has been reported.

Landscape Utilization: Home or commercial orchards are the obvious uses, but Golden Kiwi could also be used to cover an arbor, stout trellis, or strong fence; climbing is by twining of the stems.

Other Comments: A very promising vine for home fruit production, but *A. chinensis* probably offers limited potential for use in commercial landscapes due to maintenance, robustness, and messy fruit on female plants; pubescence on this species is somewhat softer than on *A. deliciosa*; many of the early experiences with *Actinidia* for fruit production in the Southern USA were with *A. arguta* which did not receive sufficient chilling and thus languished, giving the impression that Kiwis had poor potential as a commercial fruit crop; subsequent experiments with *A. chinensis* and *A. deliciosa* are challenging this initial assessment; Dr. David Creech and associates at the Mast Arboretum at Stephen F. Austin State University have been leading trialing efforts in Texas; the genus name derives from Greek word aktis meaning ray in reference to the radiating arrangement of the styles in the flowers.

Native Habitat: Although oft associated with Australia or New Zealand from which plants were introduced to the American nursery trade and fruit market, this species is actually native to China and Taiwan, hence the specific epithet that refers to China.

Related Taxa: The genus *Actinidia* J. Lindley (*Calomicta*, *Heptaca*, *Kalomikta*, *Trochostigma*) contains about 50 Asian species, many native to China; several cultivars of *A. chinensis* have shown promise in the Southern USA, including 'Golden Dragon' (best so far) and 'Golden Sunshine'; 'Golden Tiger' is recommended as a male pollinator for 'Golden Sunshine' and 'Hortkiwi' is similarly recommended for pollination of 'Golden Dragon'.

Actinidia arguta (P.F. von Siebold & J.G. Zuccarini) J.É. Planchon ex F.A.W. Miquel

Hardy Kiwi

(*Actinidia callosa* var. *arguta*, *Actinidia cordifolia*, *Actinidia giraldii*, *Actinidia hypoleuca*, *Actinidia kwangsiensis*, *Actinidia megalocarpa*, *Actinidia melanandra* var. *kwangsiensis*, *Actinidia platyphylla*, *Actinidia purpurea*, *Actinidia rufa* var. *arguta*, *Trochostigma argutum*)

- This species is also known as Arctic Kiwi, Baby Kiwi, Bower Kiwi, Cocktail Kiwi, Dessert Kiwi, Grape Kiwi, Taravine, or Vine-Pear and is native to Central Asia, China, and Eastern Asia; it is reportedly naturalized in limited locations in the Northeastern USA; this 25' to 30' (100' in native lands) deciduous woody vine is hardy in USDA hardiness zones 3 to 8, but does not fare as well further south due to inadequate chilling for budbreak; the long petioled oblong-ovate leaves are a dark glossy green above and green beneath at maturity; the specific epithet means sharply toothed in reference to the leaves.
- Bloom is in spring and is susceptible to damage by late frosts; Hardy Kiwi fruit are late summer to fall ripening, edible, and have smooth green skins, but are much smaller than those of *A. chinensis* or *A. deliciosa*, being about the size of a large grape; when grown from seed, plants take five to ten years to begin to bear, which is why it is better to use rooted cuttings or grafts from mature plants.
- In addition to the problems noted for *A. chinensis*, *A. arguta* is reported to suffer from two-spotted

spider mites and Japanese beetle infestations.

- *Actinidia kolomikta* (C.J. Maximowicz & F.J. Ruprecht) C.J. Maximowicz (*Actinidia gagnepainii*, *Actinidia leptophylla*, *Actinidia maloides*, *Actinidia tetramera* var. *maloides*, *Kalomikta mandshurica*, *Prunus kolomikta*, *Trochostigma kolomikta*), Arctic Beauty Kiwi, is sometimes grown as an ornamental in USDA hardiness zones 4 to 8; it is also known as Hardy Kiwi, Kishmish, or Manchurian Gooseberry; this woody vine is grown primarily for the smaller, ovate to oblong-cordate, acuminate tipped leaves which are white to pink on the distal halves of the leaves; flowers are small and sort of hidden within the foliage; it has small green oblong to ovoid sweet flavored fruit of irregular shapes and quality; the specific epithet refers to a colloquial name for the Amur region in Asia from which it originates.
- *Actinidia polygama* (P.F. von Siebold & J.G. Zuccarini) C.J. Maximowicz (*Actinidia lecomtei*, *Trochostigma polygamum*), Silver Vine or Cat-Powder, from Far East Russia, Japan and Western China is sometimes grown as an ornamental in USDA hardiness zones 4 to 8; leaves are less thick, smaller, and medium to broadly ovate to obovate compared to *A. chinensis* or *A. deliciosa*; irregular white variegated leaves are intermixed with fully green ones and are responsible for the name of Silver Vine; small white flowers are pleasant in appearance, but mostly hidden amongst the foliage; fruit are green to yellow-orange and irregularly elongated; rumor has it that various parts of the plants have similar intoxicating effects on cats as Catnip and it was once used in training lions and tigers; the specific epithet refers to the occasional flowers with both male and female parts appearing in this species in an otherwise predominantly dioecious genus.

Actinidia deliciosa (A.J.B. Chevalier) C.F. Liang & A.R. Ferguson

Kiwifruit

(*Actinidia chinensis* var. *deliciosa*, *Actinidia chinensis* var. *hispida*, *Actinidia latifolia* var. *deliciosa*)

- Also known as Chinese Gooseberry, Green Kiwi, Ichang Gooseberry, Kiwi, Monkey Peaches, Sheep Peaches, Strawberry-Peach, or Yang Tao, this is the taxon which first became popular in the American produce marketplace and is the plant folks think of when asking about Kiwifruit; although a native of China, it entered the American marketplace via fruit growers in Australia and New Zealand and hence is erroneously thought to be derived from that continent.
- Fruit are bright to dark green fleshed, filled with black to purple-black seeds, more tartly flavored, oblong-ovoid, may be smaller with an average length of about 2½", and are more densely covered in a dark brown pubescence compared to those of *A. chinensis*; while the flesh and seeds are edible, the fuzz from the fruit have been reported to cause throat irritation in some individuals when ingested; the 1" to 2" diameter, fragrant, five to six petaled, white to creamy yellow flowers are dioecious and both sexes are required for fruit set; numerous cultivars have been selected for home and commercial use in China, Australia, and New Zealand, and several are now available that were specifically selected for use in the Southern USA; 'AU-Fitzgerald' is an improved fruiting selection from Auburn University, while 'AU-Arthur' is a suitable male pollinator; the specific epithet means delicious in obvious reference to the fruit.
- Although generally similar to *A. chinensis* in habit, culture, and use, *A. deliciosa* tends to have a large, 3" to 5" (8") long, broadly cordate to nearly rounded shaped leaf with tips of variable length but often longer and more prominent than on *A. chinensis*; this woody deciduous sprawling or twining vine can grow to 30'; twisted dormant stems are sometimes harvested for use in floral arrangements; leaves and new growth tend to be covered in a reddish pubescence which is lost on upper leaf surfaces as they mature and tends to fade to a downy white on lower surfaces; plants are adapted to mesic regions of USDA hardiness zones 7 to 9.
- There is considerable controversy over whether this taxon should be elevated to the specific rank or relegated to a varietal status within *A. chinensis*; major databases and authorities are split on this distinction; based on initial trials at SFASU, *A. chinensis* appears to have more commercial potential in our region than *A. deliciosa*; personally I am not a big fan of the tart fruit of *A. deliciosa*, but I am a big fan of *A. chinensis* picked ripe of the vine, maybe they should have switched the specific epithets on these two taxa.

References: Adams and Leroy, 1992; Burras, 1992; National Geographic Society, 2008; Thomas, 1992.

Environs, Fourth Edition.