

## LARDIZABALACEAE

### *Akebia quinata* akebia

*Akebia* or chocolate vine, *Akebia quinata* (Houtt.) Doucne. m (*Lardizabalaceae*), is a vine in the *Lardizabalaceae* that is native to eastern Asia including Japan. The cold tolerant (to  $-20^{\circ}\text{C}$ ) deciduous or semi-evergreen vine natively grows in woods and along forest edges in mountainous areas. It is vigorous and will grow to 12 m very quickly. The combination of its vigour, vining habit and cold tolerance has led it to be labelled an invasive species in much of eastern North America where it has naturalized.

The leathery leaves are palmately compound with three to five leaflets. The plants are monoecious (i.e. they produce separate male staminate and female pistillate flowers on the same plant) with the flowers opening in mid- to late spring. The purple flowers are produced in clusters and have a scent reminiscent of chocolate. The appearance of the flowers is followed by the appearance of 5–15 cm long 'pods' that ripen in the autumn. The pods split when ripe, revealing an inner core of several hundred black seeds with edible white pulp.

While generally grown as a garden plant in the Americas, fruit is harvested from native stands in Asia and grown on a limited commercial scale in Europe. The plants are self-incompatible so cross-pollination between two genotypes is necessary for fruit set. The juicy fruit pulp is sweet with a delicate flavour. The leaves have been used as a substitute for tea and the new young shoots can be eaten as a vegetable. Numerous health benefits have been attributed to various portions of the akebia plant. The stems are supposed to have antifungal, antibacterial, diuretic and laxative activity. In China, the plant is reputed to have contraceptive qualities. In addition to these characteristics the fruit is believed to be anti-carcinogenic. Saponins and triterpenes have been isolated from akebia and are being evaluated for their pharmacological value.

The plant has been commonly used as a landscape plant in temperate climates and is primarily valued for its foliage and flowering characteristics; variegated and white-flowering forms have found their way into the nursery trade. Chad Finn

#### Further reading

Duke, J.A. and Ayensu, E.S. (1985) *Medicinal Plants of China*. Reference Publications Inc., Algonac, Michigan.

## LAURACEAE

### *Persea americana* avocado

Early Europeans found avocado, *Persea americana* Mills. (*Lauraceae*), in cultivation and distributed throughout Central

America and northern South America during the 16th century. Evidence for this includes the native names given to avocado in many languages and by archaeological findings. Carbon dating indicates Mexican avocados were used as food as early as 9000–10,000 years ago (Williams, 1976). Early accounts indicate that it was not cultivated in the Caribbean islands during the pre-Columbian period and was introduced to Jamaica by the Spaniards in about 1650. Distribution to the African and Asian tropics occurred during the 1700s and 1800s. The first recorded importation into Florida was 1833, to California in 1848 and into Hawaii during the early 19th century. By 1855, avocado trees were common in gardens of Oahu and were distributed to the other islands of the Hawaiian chain. It is now widely distributed throughout the tropics and subtropics but the use of the fruit differs in different areas.

#### World production

The world avocado production topped 2.7 million t in 2002, with Mexico producing 897,231 t followed by the USA, Indonesia, Dominican Republic, Colombia, Chile, Peru, Brazil, Ethiopia and Spain as the top ten producing countries (FAO Statistics, 2007). Mexico, Chile, Israel, Spain and South Africa were the top five exporting countries in 2001. The European and the US markets are the main markets for all avocado exports. 'Hass' is the leading cultivar in international trade. Many other cultivars are produced for local markets in each country. The worldwide consumption of avocado has increased in the past decades and this is expected to continue.

#### Uses and nutritional composition

Avocado is a nutrient dense, high oil-content food. The fruit has the highest fibre content of any fruit and is a source of antioxidants. Major fatty acids are the monounsaturated oleic acid, followed by palmitic and linoleic acids. Palmitic acid is found to approximate percentages of linoleic acid and values are slightly higher or lower depending upon the cultivars. The nutrient values of the different races also vary, but in general it is a fair to good source of phosphorus, provitamin A, riboflavin and niacin (Table L.1). The protein content of 1–2% is considered to be greater than in any other fresh fruit.

Avocado is mainly used fresh in salads, its high fat content combining well with acid fruit and vegetables such as pineapple, citrus and tomatoes or with acid dressings. A major commercial avocado product is guacamole, used as a favourite dip with potato chips, tortilla chips and similar products. Avocado may be used to supply the fat content of frozen desserts such as ice cream and sherbets. The most common industrialized use of avocado is as frozen avocado purée, as bases of unctuous products and guacamole. The second most