

January 2014 Hughie Jones

Chinese chestnut
Castanea mollissima
Fagaceae

Few tree crops have as much historical importance as a food source throughout the world as do chestnuts. Chestnuts were one of the earliest tree crops to be domesticated and were even mentioned in Chinese poetry 5000 years ago. They were considered good omens and planted at alters near temples dedicated to earthly spirits.

In fact, their family, *Fagaceae*, have a long fossil record, going back 90 million years to the middle of the Cretaceous. In China, writings about chestnut have even been found on oracle bones. There are five species in Asia, one in Europe and six in America.

Once American chestnut (*Castanea dentata*) was the dominant tree in great forests stretching from Maine to Georgia. But in 1904 Chestnut blight came in on some Chinese chestnut trees. The American chestnut had no defence. It had evolved in the absence of chestnut blight and lacked entirely the genetic material to protect it from this bark fungal disease. Within forty years, these tall stately trees were gone.

In Asia, where the pathogen originated, most native chestnut species and particularly Chinese chestnut are well defended against the blight. With thousands of years of existence with the fungus, Chinese chestnut trees acquired the genetic material that brings resistance. Blighted North American chestnut species die, while blighted Chinese ones suffer only cosmetic damage.

Now the very tree that brought the problem is being used to solve it. The genetic material responsible for the blight resistance of the Chinese tree is being introduced into the American chestnut. The antifungal protein of *Castanea mollissima* has been identified and named mollisin.

The Chinese chestnut is a medium sized deciduous tree with a spreading form and furrowed bark. It has attractive white catkins in late May through June. The scientific name *mollissima* derives from Chinese chestnut's softly downy shoots and young leaves. The down can dramatically reduce water loss; it also shades the photosynthetic cells until operational and blocks ultra violet wavelengths.

Chinese chestnut is a native of China and Korea. The republic of Korea and China are the top two countries for chestnut production, producing 40% of the world's chestnuts. Chestnuts are receiving a lot of attention from the health food industry. That is not surprising.

Chestnuts have no cholesterol, very little fat, mostly unsaturated, and no gluten. Chestnuts are the only nut that contains vitamin C. Dried chestnuts can be ground into flour as a substitute for wheat flour (gluten-free) or corn meal. In traditional Chinese medicine, chestnuts are believed to strengthen muscles and invigorate the kidney as well as adding to a person's 'Qi' (life force).



Castanea mollissima



<http://www.uky.edu/Ag/CCD/introsheetschestnuts.pdf>; **The Backcross Method – The American Chestnut Foundation**; <http://edis.ifas.ufl.edu/hs1155>; Flowering Plant Families of the World – Heywood, Brummitt, Culham, Seberg - 2007