

Cyanogenic glycosides in loquat seeds

The loquat (*Eriobotrya japonica*) (Japanese name: Biwa) is a species of flowering plant in the rose family. It is one of common fruits in China, Japan, Korea and some other Asian countries. The mature loquat fruit has orange-colored sweet flesh covered by thin and hairy peel. It has several big seeds inside.



Fig.1: Fruits and leaves

Like other stone fruits in the rose family, the seeds and leaves of loquat contain cyanogenic glycosides, mainly amygdalin, which release cyanide.

Loquat leaves have been used as a medicinal herb and listed in the Pharmacopoeia of Japan and “biwa-cha” (means loquat leaf infusion) made from dried loquat leaf is known as a traditional Japanese herbal tea. In general, cyanogenic glycosides are found much less in loquat leaves than in seeds. Drinking loquat leaf infusion poses low risk of cyanide poisoning.

In recent years, loquat seeds, waste of processing loquat into jams, jellies and other commodities, attract the attention of health food companies for its high content of amygdaline as a natural antitumor substance. Loquat seed is very hard and has a bitter taste, making it unsuitable for human consumption. Therefore, manufacturers mill or grind the dried seeds for consumption. Many powdered loquat seeds products are sold for cancer patient or health enthusiast in the functional or health food market in Japan. Some consumers are making powder by themselves from leftover seeds after eating flesh.



Fig. 2: Loquat seeds

In general, raw loquat seeds contain 2 - 5 % (w/w) of amygdalin, i.e., a piece of raw stone (about 2 g) has 2.4 - 5.9 mg of cyanide (1 g amygdalin releases 59 mg HCN). Unless manufacturers take appropriate action to reduce amygdalin in the seeds during the processing process, the product may contain very high level of cyanide compound. At the end of last year, it was revealed by research of a local authority that several powdered loquat seeds in the market were found to contain up to 980 mg/kg of high level cyanide compounds. The recommended portion size on the label of those products ranged 2 to 10 g per day. With this dose, the intake would exceed the ARfD of 20 µg/kg bw of cyanide set by EFSA when consumer eats a teaspoon of powdered product which contains high level of cyanide compounds if cyanogenic glycosides breaks down completely to cyanide and 100 % bioavailable. Therefore, the Ministry of Agriculture, Forestry and Fisheries of Japan gave instructions to consumers not to take powdered loquat seeds unless confirmed to be safe by analysis of cyanide compounds.

Powdered loquat seed products may possibly be exported as an alternative product for apricot kernels for cancer patients on a personal basis over the Internet. However, no detailed information could be obtained.