



PSEUDO RIPENED FRUITS: ARE THEY SAFE TO EAT?

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Ripening is a process in fruits that causes them to become more edible. In general, a fruit becomes sweeter, less green, and softer as it ripens. However the acidity as well as sweetness rises during ripening, but the fruit still tastes sweeter regardless. An organic compound involved with ripening is ethylene, a gas created by plants from the amino acid methionine. Ethylene increases the intracellular levels of certain enzymes in fruit and fresh-cut products, which include: amylase, which hydrolyzes starch to produce amylose, which hydrolyzes starch to produce simple sugars, and pectinase, which hydrolyzes pectin, a substance that keeps fruit hard. Other enzymes break down the green pigment chlorophyll, which is replaced by blue, yellow, or red pigment.

Mango fruits ripen unevenly on the tree and natural ripening can be very slow and unpredictable. Hence, to overcome these problems certain chemicals are used to ripen the fruits artificially. Fruits are briefly exposed to ethylene or similar gases like acetylene to initiate the ripening process. Ethylene is known to be a plant hormone that triggers fruit ripening. It has been reported that if ethylene is applied exogenously it helps fruit ripening. Ethylene - treatment is usually given at the packing house or at the point of distribution. Ethephon is known as one of the most common ethylene-generating chemical and post-harvest treatments. Ethephon accelerates ripening and improves the peel color of the mangoes. Though ethylene promotes the ripening process & improves colour development of the fruits, it has some disadvantages in post-harvest shelf life & can be harmful to product quality. Furthermore is an explosive and very expensive. Use of ethylene for ripening of the fruit is a common practice in different countries but due to high cost and scarcity in terms of its availability, many developing countries like Bangladesh, India & Pakistan use low-cost calcium carbide to ripen fruit. Usually calcium carbide is imported from China, Taiwan and South Africa. Acetylene gas is generated from calcium carbide, which initiates the ripening process in a similar manner to ethylene. This practice is commercially used in Brazil and Senegal. Fruits ripened with calcium carbide are soft and have good peel color development but poor in flavor. A number of countries use calcium carbide to ripen a wide range of fruits. Ethephon 39% (10 ml) and sodium hydroxide (2 gm), kept in a bucket close to mangoes heaped in an airtight chamber would release ethylene gas, which naturally facilitates the ripening of fruits without any harmful effect.

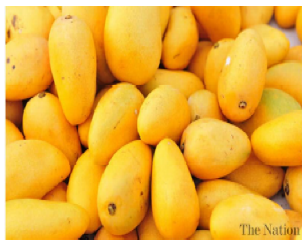
Health Hazards Associated with Carbide

Though calcium carbide is used methodically in many countries including India, in our country it is being used openly, commonly & in an inappropriate way for ripening fruits. A very strong reactive chemical, calcium carbide has carcinogenic properties. Acetylene generated from carbide is flammable and explosive even in a low concentration as compared to ethylene. Acetylene gas is an analogue of ethylene and quickens the ripening process.

Sometimes only the skin color is changed while the fruit remains unripe and raw. When a high dose of carbide is used on a raw fruit for ripening purposes it results in poor flavor of the fruit and possibly toxic. It is also considered as extremely hazardous as it may contain traces of arsenic and phosphorus hydride. Early symptoms of arsenic and phosphorus poisoning include vomiting, diarrhea with or without blood, burning sensation of the chest and abdomen, thirst, weakness and difficulty in swallowing and speech. Other effects include numbness in the legs and hands, cold and damp skin and low blood pressure and in cases it can become fatal if not treated in time. Acetylene gas had an unpleasant odor and produced a noticeable flavor in the treated fruits. It is not only toxic to the fruits but it may be harmful to those who handle it. It affects the neurological system resulting in headache, dizziness, mood disturbances. Sleepiness, mental confusion and seizures on a short-term basis, while in the long term it can cause memory loss and cerebral edema. Use of ethylene and (methyl jasmonate) MJ for fruit ripening purposes is not harmful for human consumption but these compounds are quite expensive hence developing countries use low cost calcium carbide, which is harmful and has many disadvantages compared to ethylene. In developed countries fruits are ripened commercially in an artificial chamber having no health hazards. But in our country traders are using obsolete chemical, carbide being propelled by the quick-buck syndrome. Thus we are in risk of short-term as well as long-term health effects simply by eating fruits.

1. Ethephon 39%, which is available in the market in the commercial name of ethrel, is being used as plant growth regulator in mango, pineapple, coffee, tomato, cucumber, groundnut and rubber. As this cost-effective method retains the actual colour and taste of the fruit and increases its shelf-life, this harmless method to ripen fruits could be a hit and a boon to the traders. It is essential to control the delivery system of acetylene from calcium carbide, which must be safe and applicable to the wide range of users.

2. Government, Concerned health authorities and law enforcing agencies should pay attention to this illegal practice of using carbide openly, which is occurring in many parts of Bangladesh.



3. It is important to develop new and better technique of application, which prevents direct contact of the substance with the fruits.

4. New compound, which are environmentally safe and not harmful for human health, must be discovered and tested.



Commercial ripening is an essential part of business as ripe fruits are not suitable to carry & distribute, as they get rotten. So fruit traders pick unripe fruits & use certain methods to increase the shelf life of them. Valid and acceptable methods of using chemical are desirable in this regard. Anything breach of that might be hazardous for our health.

References

Ripening. In: Wikipedia, the free encyclopedia [online], available at: <http://en.wikipedia.org/wiki/ripening>

Sy. O. and H. Wainwright. (1990). Fruit ripening with calcium carbide. *Trop Science*. 30: 411-420.