Dried Haskap berries

By Dr. Bob Bors

University of Saskatchewan Fruit Program

Figure 1. Dried Haskap package from Hokkaido.

In Hokkaido I purchased a package of dried haskap, which I prompt lost for almost 2 years. When I found it in the bottom of my closet, I was hesitant to eat it. After all, food preservatives are not allowed in Japan. I scrutinized the package and saw no signs of mold. I tried one and it was fine, then another and another. I stopped munching when I realized I hadn't taken a picture of it yet. When you look at figure 1, realize that the package when purchased looked full. That package had 60g of dried fruit which cost 1229 yen or $14.55 CDN. That would be $110.09 / lb! The size, colour, texture and flavour were remarkably similar to raisins. The only obvious sign that it was haskap was the occasional appearance of seeds.

We had a very wet summer in 2010 which made heavy mud our of our clay soils at our research plots. Consequently we did not harvest berries from our 3 year old seedlings which happen to be in a very wet spot.

Going into October we noticed that many of the plants still held onto their berries. These berries were 'naturally dried' and had lost at least half their moisture. But unlike the commercially

Figure 2. Close up of dried Haskap shown close to actual size. Except for the small red seeds, they could pass as raisings from grapes.

Figure 3. Naturally dried haskap from the field. This photo was taken on October 13th. Had the summer been a normal hot one, perhaps berries like these would have been seen in September.

dried berries, they were a beautiful blue colour (see figure 3). When several seedlings were sampled it was noted that flavour was not always like grape raisins. Some were better and others worse. Sweetness also varied. But it was also noted that some seedlings had dropped all their berries while other bushes held onto them. This was in the breeding field where each plant is genetically different from its neighbors.

Because the naturally-dried berries weren't dried fully, many were harvested and put in a fruit dryer to speed the process along (see figure 4). Berries placed in that dried all turned black.

Figure 4. The 'American Harvest' food drier that we used on Haskap berries.

Other berries were placed in a desiccator (an airtight container hooked up to a vacuum pump). Those berries when dried retained the blue colour (see figure 5).

The blue colour of haskap berries is caused by a naturally occurring wax called 'bloom' that is on the surface of many kinds of fruit, but is more noticeable in fruits of darker colours. Examples include blueberries, plums and some apples.

The drier we used creates heats to dry fruit faster which caused the wax to melt and disappear into the berries. Unfortunately, the drier we had did not have a setting to turn off the heat. It would have been nice to just have the fan running to dry the berries faster than the desiccator methods which took a couple days.

We have noticed that frozen berries are also blue, but when thawed the berries leak juice. It might not be feasible to dry such berries at room temperatures to retain the colour. The quality of the resulting product would be lower as all the sugars in the

juice would be lost. If going for a high end product it might be best to dry fresh berries or let them ripen naturally on the bushes.

Figure 5. Haskap berries dried at room temperature (left) retained their blue colour while berries dried using heat (right) became black.

Marketing and cost concerns

Dried blue-coloured haskap would likely have greater marketing appeal over black dried haskap and over raisins. But the extra time to dry them at lower temperatures would likely increase the cost. Perhaps there would be food safety concerns since the berries aren't heated. Such berries would be best used in products where they could be consumed raw like in trail mixes, breakfast cereals and salad toppings. To be marketed for use in baking in muffins or other baked goods would defeat the purpose of retaining the blue colour. They would simple turn black when heated.

Freeze drying is another possibility that would likely retain the blue colour, but that method is even more expensive than drying at room temperature.

Breeding possibilities

It should be possible to breed and select haskap for the dried fruit market. Flavour will have to be evaluated in the dried state. Likely some selection criterion will be at odds with what we look for in varieties for fresh or frozen markets.

In the fresh market, round berries that come off relatively easy at harvest time are ideal. Round berries are easier to handle with machinery and they last longer both on the bushes and later in storage.

Perhaps an ideal dried haskap variety would be long and thin (like many Russian varieties) because they would dry quicker than rounder berries due to increased surface area. However, bushes of Japanese Haskap hold onto their berries when ripe while Russian varieties tend to drop their fruit. Perhaps some 'Russian x Japanese' hybrids would have the right combination of attributes. But that combination would only be needed if a grower intended to dry the berries

naturally, outside and on the bushes. It may be possible that driers could be developed with higher wind speeds that could do an acceptable job of drying haskap at lower temperatures. Then there would be no need to wait the berries to dry naturally. Even with good driers, only so many fruit can be handled at a time. A variety that holds onto its fruit while drying would have a long harvest window particularly if the berries are allowed to shrivel.

We plan to investigate dried Haskap berries further in our breeding program. It is ironic that it took a wet year to bring this to our attention. We could certainly use a normal or dry year to better investigate this!

For more information visit our website: www.fruit.usask.ca