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Fighting cancer by the bramble; Scientists are hot to unlock the medicinal secrets of black raspberries

Mike Lafferty, THE COLUMBUS DISPATCH

After nearly two decades under the microscope, black raspberries are beginning to look a lot like a medical superfruit, one of an emerging group that researchers jokingly call "fruitaceuticals."

In the 1990s, Gary Stoner, an Ohio State University cancer scientist, showed that concentrated doses of black raspberries seemed to help fight tumor formation in the colon and esophagus.

Stoner's work was followed by that of other OSU researchers who showed that the fruit inhibited the formation of oral-cancer tumors, at least in tissue cultures and in hamsters.

Most recently, research showed that a gel made from black raspberry extract halted skin-cancer development in lab animals.

"In terms of shutting down the inflammatory response, we've never seen anything like it," said Dr. Anne VanBuskirk, an immunologist and surgeon in Ohio State's College of Medicine.

Inflammation and tumor formation are closely associated, and if the fruit can stop inflammation, then it also might knock out cancer long before it forms.

Stoner now gives dozens of lectures annually. And the research is attracting federal grants, something Stoner said wasn't easy in the early days.

"They were only interested in drug (research)," he said.

Now, the government has a branch that studies diet-related disease prevention, and scientists nationwide are trying to understand the anti-cancer attributes of many fruits and vegetables.

But there is something about black raspberries.

In March, University of Pittsburgh scientists reported that black raspberry extract killed leukemia cells in cultures while sparing healthy cells.

The hope is that black raspberries and other botanicals might provide doctors with less toxic alternatives to drug and radiation therapy, said Dr. Xiao-Ming Yin, a researcher at the University of Pittsburgh School of Medicine.

The attention is focused on anthocyanins, chemicals that give spring flowers and autumn leaves their vibrant colors.

The chemicals are abundant in blackberries, blueberries, strawberries, elderberries, grapes and plums. The darker the fruit, the more anthocyanins.

Among common fruits, black currants have the highest levels, roughly one-third more than black raspberries. However, Stoner points out that black raspberries have several forms of the compound while black currants have one.

In plants, anthocyanins act as a sunscreen, absorbing high-frequency blue-green light. As antioxidants, they scavenge free radicals that form in plant tissue through ultraviolet radiation.

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Such wide functionality means blackberry extracts likely are effective in many types of cancers, scientists say.

And red raspberries, blueberries, grapes and raisins, strawberries and other fruit containing anthocyanins also are likely beneficial, Stoner said.

Stoner, who eats about 16 ounces of fresh berries a week, said he became interested in black raspberries in the 1980s, when he concentrated his studies on the anti-cancer effects of ellagic acid.

"I was naive," Stoner said.

Black raspberries actually contain many compounds with antioxidant qualities. But it wasn't until the mid-1990s that Stoner turned to anthocyanins, which began to emerge as the most potent of the compounds.

Anthocyanins appear to work by inhibiting compounds that weaken the immune system and stimulate tissue inflammation.

They also seek out and destroy harmful free-radical molecules that circulate in the body, attack cells and cause aging, heart disease and cancer. Exactly how they do this, however, remains a mystery.

University of Pittsburgh research has shown that a form of anthocyanin called cyanidin-3-rutinoside is a strong antioxidant and is similar to compounds called polyphenols, which are found in green tea.

And it causes cancer cells to break down.

The Pittsburgh scientists found that cyanidin-3-rutinoside caused potent oxidants called peroxides to accumulate and kill leukemia cells.

Anthocyanins appear particularly useful for people who have had cancer surgery and are at risk of recurrence.

In a study at Ohio State, Dr. Chris Weghorst is giving patients concentrated black raspberry powder before they undergo oral-cancer surgery.

"Many of these patients are chronic smokers. Their oral cavity is not normal. There is a high likelihood of a new tumor developing or cancer recurring," he said.

The idea is to maximize the exposure time of the extract on the gums by having a lozenge melt slowly in the patient's mouth.

"One of the big questions is, can you expect someone to take three lozenges, four times a day for six months," Weghorst said.

In VanBuskirk's skin-cancer experiment, lab animals were dosed with a salve of concentrated extract.

VanBuskirk wants to use it in patients who have a high risk of developing skin cancer, especially organ recipients. The anti-rejection medicines that they must take can cripple their immune systems, making them susceptible to the ill effects of sunlight.

The anthocyanin levels in extracts are 10 times more concentrated than in fresh black raspberries. The extracts are made using freeze-dried berries grown in one field at a fruit farm near Wilmington, Ohio.

Scientists suspect the different anthocyanins in black raspberries work together and with other antioxidants in the berries.

"When you get multiple antioxidants ... it's like putting a battery in the immune system," said Dr. Arnold Leonard, a researcher at the University of Minnesota.

Concentrated black raspberry extracts gave 200 times the anti-inflammatory benefits of aspirin, but without the side effects, Leonard said.

"If anyone had told me 10 years ago I'd be using this stuff, I'd tell them I'd be in the loony bin," he said.

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