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Reducing bad effects from diabetes: The healing plants and AGEs*

About the study

Peoples around the world use plants to treat diabetes. Recently, someone tested 1,200 of these plants to see if they lowered blood sugar. It turned out that 80% of them did. So there is a lot of promise in looking at the plants that people have traditionally used. After all, these remedies are available locally and people are used to relying on them.

This study takes a closer look at how the Iiyiyiu plants[†] prevent some of the problems that go with diabetes. Specifically, it looks at whether the plants keep “AGEs” from forming in our bodies. AGEs are particles that play a role in many of the health problems that diabetes causes.

About plants and AGEs

Sugar can combine with other things in our bodies to form particles called “free radicals” and “AGEs.” Because people with diabetes have a lot of sugar in their blood, they have a lot of these particles. Some of them do no damage, but others are harmful. The harmful types can damage the lining of our veins and eventually make them clog up. In the long term, this contributes to some of the problems that go with diabetes like

- Heart disease
- Eye problems

* This is a plain-language version of an article by Cory S. Harris, Louis-Philippe Beaulieu, Marie-Hélène Fraser, Kristina McIntyre, Louis Martineau, Alain Cuerrier, Timothy Johns, Pierre Haddad, Steffany Bennett, and John Arnason called “Characterizing the inhibitory effects of Cree medicinal plant extracts on in vitro formation of advanced glycation endproducts.” (Draft of Sept 15, 2008.)

[†] See Table 1 at the end for a list of the plants in this study.

- Kidney problems
- Tingling or loss of feeling in the hands and feet.

This is why a lot of the research these days is looking for drugs or plants that will reduce the number of AGEs in our bodies.

Do the healing plants fight AGEs?

There are over 50 different types of AGEs, and we cannot check if the plants fight every one of them. But we can test different types or groups of AGEs. In this study, we ran tests on two different kinds of AGEs.

Tests on AGEs that absorb fluorescent light

A subgroup of AGEs can be detected by the way they absorb fluorescent light. This allows us to check (in a lab dish) if fewer AGEs are formed when you add plants to the mix. It turns out that six of the plants do reduce how many of this particular kind of AGEs get formed. A few of the other plants seem to make things worse—more AGEs get made. And some of the plants are good at low doses, but not so good at higher doses.

Tests on a second type of AGE

We also looked at whether the plants fight a particular AGE called CML. We chose this one because we know it helps cause some of the problems that go with diabetes. We found that all of the plants help reduce how much CML gets formed. Unlike in the first test, none of the plants caused bad effects.

In short, many of the plants do fight different types of AGEs, and this could help prevent some of the problems that go with diabetes. This shows that the traditional use of these plants to treat symptoms of diabetes was well-founded.

Figuring out how the plants fight AGEs

When we look at the studies that the Anti-diabetic Plant Project has done so far, we notice that the plants that are good at fighting AGEs are the same ones that fight free radicals. They also seem to be the ones that are strong in “phenolic” ingredients. (Phenolic ingredients are the brown ones that leak out into water the way tea does.)

We believe that these three things are related. To check, we listed the plants three ways:

- By how good they are at fighting AGEs
- By how good they are at fighting free radicals
- By how many phenolics they contain

Then we compared the three lists. We found that the plants were in roughly the same order on all three lists. This leads us to believe that the plants fight AGEs partly by getting rid of free radicals (which help create AGEs). It also leads us to believe that the ingredients that are doing this are the phenolic ones.

We also had a list of the plants that the healers use most for symptoms of diabetes. Interestingly, when we compare this list to the list of AGE-fighting plants, we notice some differences. The healers’ list is more like the list of plants that fight free radicals. This may be because, in human beings, it’s easier to notice the effects of a plant that fights free radicals.

Conclusions

This study shows us that the healing plants are good at fighting several types of AGEs in the lab. If this also applies in real life, this is one way the plants could help reduce the problems that go with diabetes.

We also notice that the phenolic ingredients in the plants seem to be the ones that are best at fighting AGEs. Past attempts to create drugs that fight AGEs have

failed because the drugs had too many side effects. We might get better results by using plants and other foods that are high in phenolics.

Besides fighting AGEs and free radicals, some of the Iiyiyiu plants also protect against problems like:

- Inflammation (heat and swelling)
- Damage to nerve cells
- Damage to areas like the eyes

These are all problems that people are trying to develop drugs for. So we can see that the Iiyiyiu plants might be a very good option for treating diabetes. They could be used by Iiyiyiuch and by other people who prefer traditional healing methods.

There could also be benefits for other peoples besides the Iiyiyiuch. The ingredients in the Iiyiyiu plants are also found in many other plants around the world. It's likely that these other plants will also turn out to be effective, low-cost, and acceptable to the people who live in the area.

Table 1: Iiyiyiu healing plants used to treat symptoms of diabetes

English name	Cree name	Part used	Rank *
Balsam fir	Inaast	Bark	8
Speckled alder (gray alder)	Atuspiih	Bark	11
Creeping snowberry	Piyeumanaan	Leaf	17
Juniper	Kaakaachuminatukw	Fruit	4
Sheep laurel	Uischichipukw	Leaf	9
Tamarack larch	Waatinaakan	Bark	3
Stag's horn club moss (ground pine)	Pastinaakwaakin	Whole plant	15
White spruce	Miinhikw	Needle	6
Black spruce	Iinaatikw	Cone	5
Jack pine	Ushisk	Cone	14
Balsam poplar	Mash-mitush	Bark	16
Labrador tea	Kaachepukw	Leaf	2
Marsh Labrador tea (northern Labrador tea)	Wiisichipukw	Leaf	1
Diamondleaf willow	Piyeuwaatikw	Bark	10
Pitcher plant	Aygadash	Leaf	13
Showy mountain ash	Muskumanaatikw	Bark	7
Lowbush cranberry (mountain cranberry, lingonberry)	Wiishichimanannh	Fruit	12

* The rank reflects how many healers mentioned the plant, and also how many different symptoms it was used for.