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Ingredients in Pitcher Plant that Protect Against Nerve Damage*

Purpose

This study looks at whether pitcher plant protects nerve cells against the type of damage that diabetes causes.

Using pitcher plant for healing

Aboriginal peoples across North America have long used pitcher plant (Aygadash) as a remedy. In fact, people have tried using it to treat many different illnesses, including smallpox. Recently, a product made from pitcher plant root, called Sarapin, has been sold as a painkiller.

In Iiyiyiu Aschii, the elders told us that they use leaves from pitcher plants to treat some of the symptoms of diabetes. In particular, they use the plant to treat wounds that are slow to heal. And other studies in the Anti-diabetic Plant Project have already shown that pitcher plant leaves:

- Help cells to absorb more sugar (like insulin does)
- Help protect nerve cells against damage from too much or too little sugar

In this study, we took a closer look at how pitcher plant protects nerve cells against damage from too much sugar. We compared whether the leaves or the root are better for this purpose. And we looked at the ingredients in the plant, to figure out which ones are responsible for the nerve protection.

* This is a plain-language version of an article by Cory Harris, Muhammad Asim, Ammar Saleem, the Elders of Eeyou Ishtchee, Louis Martineau, Pierre Haddad, John Arnason, and Steffany Bennett called “Bioassay guided isolation of neuroprotective constituents of *Sarracenia purpurea*, a Cree medicinal plant that inhibits glucotoxicity in PC12 cells.” (Version of September 15, 2008.)

Is it better to use leaves or roots?

First, we tested pitcher plant on nerve-like cells in a lab dish, to see if they keep the cells from being killed by too much sugar. We tested the root and the leaves separately. The root did not help protect cells against this kind of damage. The leaves did, and the more leaf tea you added to the mixture, the more protection you got.

Looking for the active ingredients in the leaves

Next, we tried to find out which ingredients in the leaves are having these good effects. This is hard to do, because all the ingredients in a plant are mixed together. So we did it in stages. First, we divided the ingredients into three large groups and repeated the nerve-protection test on each group. Then we picked out the groups that had effects, divided them into smaller groups, and repeated the process. We kept on until we had narrowed down to three ingredients that are part of a family called “quercetins.” These three ingredients seem to account for most of the effects, but not all. Perhaps some of the ingredients work best along with other ones, rather than alone.

It is interesting that we found quercetins as the active ingredients. We notice that many natural remedies have ingredients from this family. Some people call the family “Vitamin Q.” And in fact other people have already been testing quercetins as a remedy for some of the problems that go with diabetes. But until now, we didn’t know that pitcher plant leaves had so many of these quercetins in them or that they could protect cells from too much sugar.

Now that we know that pitcher plant works with quercetins, we can take a guess at how some of the other Iiyiyiu plants work. For instance, we’d already found that needles (but not bark or roots) from white spruce (Minhikw) protect nerve

cells against damage against sugar.* And we know that the needles, unlike the bark and roots, have lots of quercetins in them. So now we're guessing that it's the quercetins in spruce needles that help protect nerve cells.

Comparing the ingredients in the leaves and roots

We also compared the ingredients in the leaves and in the roots. The two had a lot of the same ingredients, but in different proportions. In particular, the roots had fewer ingredients from the quercetin family. This could explain why the leaves work better to protect nerve cells. The elders had already told us that they use mostly the leaves. So our tests have reached the same conclusion, using science, as the elders reached using their traditional knowledge.

Finally, we used these findings to broaden our knowledge about types of plant ingredients. The quercetin family belongs to a larger “clan” of ingredients called flavonoids. Sometimes ingredients in the same clan have similar effects, but not always. In this case, it turns out that only the quercetins help protect nerve cells; the other ingredients in the clan do not. Now we know that we need to pick members of this particular family if we want to get these effects. [*Note to translator. Brian* — if the “family-clan” analogy is not a good idea, can you let me know and we'll change it for something else? Thanks – Ellen]

* See the article in this series called “Anti-diabetic activity of medicines made from needle, bark and cone of minihw: how different parts of the tree protect from too much or too little sugar.”