

Is *Oplopanax hypoglycemic*? An invitation for office-based research

by Paul Bergner

Abstract

Oplopanax horridum (Devil's Club) is rumored in North American herbalism to have blood sugar-lowering effects. The history of the ethnobotany, case reports, and clinical trials of *Oplopanax* for the treatment of diabetes is reviewed. Historical reports and clinical data on the hypoglycemic effects of the plant are inconclusive. A structure for simple individual or small group office-based research is presented.

Diabetes entered into North American native populations only during the mid 20th century (Trowell and Burkitt), and thus we don't find mention of *Oplopanax* for diabetes in the earliest ethnobotanical literature of the Pacific Northwest. The first mention of *Oplopanax* in ethnobotany comes from Canadian James Teit, who was married to a Thompson Indian woman in British Columbia at the turn of the twentieth century. Tait was fluent in the language and active in tribal politics and affairs, and wrote a number of ethnographic treatises on various aspects of the life and culture of Native Americans of the Pacific Northwest. Posthumously, his field notes on plants of BC were collected, edited and published (Teit). He reports uses of *Oplopanax* for indigestion, stomach problems, and for respiratory and topical complaints. He notes its use as a laxative, tonic and blood purifier, but with no mention of diabetes. Harlan Smith reports similar uses in 1927, by a variety of tribes, with an emphasis on uses as a purgative, again with no mention of diabetes (Smith). Dr George Darby, a missionary doctor who lived among British Columbia Indians, wrote of *Oplopanax* in 1933, again emphasizing its use as a cathartic, with no mention of diabetes. By 1949, however Dr. John MacDermot of British Columbia stated in 1949 that Darby had "some years ago" reported that Indians were using the plant for diabetes. Apparently in the intervening years, diabetes had become more common in the area, a timeline consistent with the emergence of the first cases of diabetes on U.S. Indian reservations (Trowell and Burkitt).

In 1938, a case report of a Native man using *Oplopanax* to control his diabetes was reported in the *Journal of the Canadian Medical Association*, along with a report of strong hypoglycemic activity of a water extract of the plant given orally to rabbits (Large and Brocklesby). The case study was of a surgical patient who developed marked symptoms of diabetes while in the hospital. He had apparently been maintaining good health for several years while taking *Oplopanax* tea, and regained health on resumption of the tea after leaving the hospital. The case is not necessarily proof of hypoglycemic activity in the plant. Natives in the area took, and still take, *Oplopanax* as a kind of panacea for many different conditions when ill. It is also common for patients with mild or well controlled diabetes to lose control in the altered environment, surgical stress, and enforced bed rest of a hospital stay. The emergence of the diabetes in this patient was not necessarily due to the withdrawal of the *Oplopanax*. In the rabbits, both oral and intraperitoneal administration of a water extract lowered glucose when given as part of a glucose challenge. *Oplopanax* given alone, however, without the glucose challenge, raised the animals' blood glucose, and the authors postulated constituents in the plant with contradictory effects. The implications of the possible glucose-elevating effect of the tea in humans, if not taken with glucose, is not clear. Trials in the next few years failed to confirm the findings (Piccoli et al.; Stuhr and Henry) and MacDermot reported in 1949 that a test at University of Toronto had failed to show any effects.

Later case reports and small studies.

- ♣ MacDermot also reported in 1949 on the emerging use of *Oplopanax* for diabetes, and cites a case in his own experience of a white diabetic who managed their diabetes with *Oplopanax* tea and "apparently remained in good health," although "sugar still appeared in his urine."
- ♣ In a 1966 trial frequently cited as evidence for the hypoglycemic effect of *Oplopanax* in humans, Justice gave 100 gram glucose challenges with and without *Oplopanax* to two patients with Type II diabetes (Justice). Although the author states that the results "tend to" confirm the previous animal trials showing a hypoglycemic effect of the plant, the data do not support that statement, an opinion shared by other researchers (Thomassen). In one of the two patients there was no significant change in the glucose tolerance test with and without *Oplopanax*. In the other there did appear to be some lowering of the glucose levels on challenge.
- ♣ In 1988, Deagle published a report of a single diabetic patient who controlled blood glucose using *Oplopanax*, but did not give any details (Deagle), including glucose levels.

In 1990 Thomassen et al. did the most methodical testing of the effects of *Oplopanax* on blood glucose to date, although on a small set of four subjects. Two patients had been admitted for uncontrolled diabetes, one of them with Type I and the other with Type II diabetes. Both had been taking *Oplopanax* tea before admission and planned to start again on discharge. Researchers withheld insulin from a 35 year old white male with type I diabetes to establish a baseline while eating a typical 3-meal diet, They then repeated this withdrawal, again with a typical diet and with 80mL of devils club tea every four hours. There was no alteration of the blood glucose curve after taking *Oplopanax*. On both days after withholding insulin, the uncontrolled blood glucose rose to about 650 mg/dL at its peak. Urinary ketones were likewise similarly high with and without the tea.

In a second case a 79 year old recent onset Type II diabetes was following low calorie diet (1200 calories/day). Researchers established baseline glucose curve with a typical diet for 2 days. Glucose ranged between a low of 60 and a high of 155, with a mean of about 110 mg/dL. The woman then consumed 80- mL of *Oplopanax* tea 4 times per day for 3 days along with her typical diet. While taking *Oplopanax* the blood glucose ranged between a low of 58 , a high 112, and a mean about 105. The authors discount any significant pharmacological effect of the *Oplopanax*, stating that the blood sugar had started declining on admission to the hospital, trending downward, and that this trend continued during the *Oplopanax* period, and then further on discontinuation of the herb. The authors also tried a similar protocol on two healthy subjects. There was no change in the blood sugar. One subject vomited after taking two doses (80 mL each at 1200 and 1700 hours) of the tea, experienced light-headedness, and discontinued it at the end of the first day. The emetic effect is consistent with traditional usage for that purpose.

Although there remains a lack of any definitive data showing lowering of actual blood sugar measurements in humans, enough anecdotes and ethnobotanical reports of symptomatic improvement in diabetic subjects taking *Oplopanax* remain to arouse interest in the possibility that the plant has some benefit in diabetes. The standard of diabetes care at the time of the individual anecdotes and ethnobotanical reports above has to be taken into account. Technology for assessment of blood glucose was crude by today's standards, and as late as the 1970s, the medical standard for patient for assessing control was a monthly measurement at a lab. For most of the 20th century, the disease was defined by glucose in the urine and the symptoms of thirst, wasting, and frequent urination. Thus "control" was assessed by the general symptomology rather than actual blood sugar measurements. Actual effects of the plant on serum glucose cannot be assessed from such information.

The reported anecdotes, spanning more than forty years, describe patients whose symptomology was maintained at a normal level despite the presence of sugar in the urine. Such control of symptoms, even if glucose remains abnormal, is not trivial. But it could also be deceptive if the symptoms of diabetes are merely masked while glucose continues to damage the tissues. The subject with Type I diabetes in the report by Thommasen had *alarmingly* high glucose and ketones on days with and without the *Oplopanax* when insulin was withheld. Yet on the day without the herb, by 5PM he reported “heart pounding all the time,” thirst, lack of energy, and muscle pain. Later nausea and vomiting ensued. On the day while taking *Oplopanax* under the same circumstances, with the same high glucose and ketones, he reported feeling “fine” with some thirst and fatigue at the end of the day. The disparity between the objective measurement of diabetic control, and the patient's subjective assessment of his own condition was very wide.

Research

Even in the absence of large funded trials, current technology for monitoring blood glucose and insulin would make office-based research on individuals or small groups possible. Long term control of glucose can be easily assessed with the glycosylated hemoglobin test (HbA1C); and long term insulin resistance can be with a standard lipid panel measuring the insulin-surrogates triglycerides and HDL cholesterol. Elevated insulin produced elevation in triglycerides and and/or a decrease in HDL cholesterol. The method employed by Thomassen above, would involve:

- 1) Establishing a baseline of regular glucose measurements through home monitoring with normal diet and activity over at least two days. The diet and activity could be assessed with a journal for added information.
- 2) Introducing *Oplopanax* in the form and dose to be tested, while measuring glucose on the same schedule, for three days while continuing to journal a typical diet and activity schedule.
- 3) Removal of the *Oplopanax* and continued monitoring for two more days.
- 4) Longer term trials lasting 6 weeks to 3 months might measure the effect of chronic use of *Oplopanax* on HbA1C, triglycerides, or HDL cholesterol.

In all of the reported literature, the traditional use of a tea is described. There is no consistency in the exact plant part used; roots, stems, stem bark, and twigs have all been reported. If using the tea, traditional emetic and cathartic effects should be borne in mind. In individual provings in a group of students, some of the individuals felt nausea on consumption of as low as four ounces of the decoction. Traditionally “several” cups of tea were used for emetic or cathartic purposes. There is no traditional use of the tincture, and no reports of it appear in the medical or ethnobotanical literature.

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