

MEDICINAL USES OF SOME AMERICAN CARNIVOROUS PLANTS

by Donald Schnell

Being a physician, I am always interested in reading about past, current and possible future uses of various native American plants in medicine. At one time early in the colonization of our country, it was very important for doctors to be able to accurately identify native plants of medicinal value since these were often the only sources of drugs and remedies available to him. Shipments from Europe were not reliable and the doctor was pretty much on his own. Physicians were very well schooled in botany, often to a rather advanced degree considering the times, and some of our most active early botanists were also physicians. While searching through the woods and meadows for medicinals, or traveling trails between farms to visit his patients, the doctor often stopped to notice and originally describe new species, and to even do some basic research.

The following note describes some early medicinal uses of two of our native CP genera, and one possible future use for another. At the onset, I must warn readers *not* to try any of these various concoctions themselves—most of the remedies are unproven and based on anecdotal experience only. The various extracts and even the extractants could be quite poisonous. All drugs, even our most modern synthetically produced medicines, are in fact poisons administered by the physician in a closely controlled manner in hopes of doing the patient some good. The margin between safety and toxicity is often close and sometimes unpredictable in the individual. The author and editors of CPN cannot be responsible for any mishaps should someone foolishly try one of these remedies. This article is presented for interest's sake only.

The bulk of this note is based on a book by Charles F. Millsbaugh called *AMERICAN MEDICINAL PLANTS* and originally published in 1892. It is now

available as an inexpensive Dover reprint published in 1974 (Dover Publications, Inc., 180 Varick St., New York City 10014). Any other references will be noted in the article.

Sarracenia purpurea ssp. *purpurea*

The earliest reports of medicinal use of this plant came to early colonists from the Indians who used it in treatment of smallpox (a disease colonists brought to the Indian!). An infusion was prepared from the rhizome and supposedly shortened the course of the dread disease as well as helped prevent pitting and scarring by the pox lesions. In 1861 in eastern Canada, an epidemic of smallpox broke out among unvaccinated Indians and a Dr. Miles of the Royal Artillery stationed in the region stated that the Indians expressed little alarm as squaws prepared infusions of the rhizome and treated cases, all of which were said to have been successfully treated and even cured. An evaluation of the extract was published and discussed by the Medical Society of Nova Scotia and a resolution passed indicating that the treatment was unproven.

During the American Civil War, the extract was tested in a hospital in Alexandria, VA on smallpox cases, and fifty percent of those cases so treated were lost, more than any other method of treatment. Still, scattered reports on the eastern Canadian frontier persisted among various European physicians who claimed to have witnessed success among the Indians, and in one case a physician claimed the preparation saved his own brother's life. I doubt that there was any degree of uniformity of preparing the infusions at that time and such variability may have played a part in the differing results.

In 1892, the preparation for use was done by collecting the rhizomes or the whole plant early "in fruiting," chopping it up, and extracting it in alcohol for eight

SPECIAL NOTICE

CARNIVOROUS PLANT WORKSHOP

WHEN: August 11, Saturday, 1:00 - 3:30 PM

WHERE: University of California, Botanical Garden Meeting Rm., Berkeley, CA

WHO: For all between the ages of 10 to adult.

COST: \$15.00 with check payable to U.C. REGENTS.

Send to: Education Program, Botanical Garden, University of California, Centennial Drive, Berkeley CA 94720

INSTRUCTOR: J.A. MAZRIMAS

CLASS DESCRIPTION: In this course, carnivorous plants will be the subject of a brief history, a discussion of the different trapping mechanisms and some aspects of how to grow them successfully. A slide show will depict examples of some exotic species and live plants will be used to point out interesting adaptations for attracting and digesting insects. Students will be able to take home some plants provided by the Botanical Garden and detailed instructions will be given on how to grow them.

days in a cool, dark place. The extract was then recovered for use. Various chemical substances claimed to be in the extract included an alkaloid called sarracenin isolated as crystals, acrylic acid as a sour liquid and sarracenic acid, along with some tannin.

At the time of publication by Mills-paug, physiologic actions of the alcohol extract were described as diuresis (increased urinary output), catharsis and gastric "excitation," and "increased and irregular heart action with congestion of the head." One worker noted that use of the extract caused an eruption on the skin similar to smallpox itself!

Clearly, medicinal use of this plant in early days was of dubious value, but one wonders what more modern methods of research with careful controls might yield.

Drosera rotundifolia

In the sixteenth century, this species (which also grows in Europe) was supposed to be curative of consumption, an older name for tuberculosis. It was also claimed to be of value in treatment of asthma. Rafinesque stated that "the juice" destroyed warts and corns, and when used topically with milk helped freckles and sunburn (the sap caused milk to

"clabber" or semi-solidify). The most famous and constant use was as an anti-tussive (cough suppressant) for symptomatic treatment of various diseases involving coughing.

At the time of publication of Mills-paug, the extract was prepared by chopping and pounding the entire fresh plant to a pulp, then placing the material in a small piece of clean linen which was twisted causing the juice to filter and exude through the linen. It was collected and added to an equal part of alcohol, and this mixture was also allowed to stand for eight days in a closed container in a dark, cool place. The only chemical identified at the time in this extract was alizarin.

The whole plant was early on considered poisonous, especially to grazing sheep. One experiment resulted in three cats being poisoned and autopsy disclosed lung and gastrointestinal tract lesions. In excessive doses, the juice resulted in "shuddering," sense of pain and constriction in the chest, rawness in the throat, cough, hemoptysis (bloody cough), abdominal pain, diarrhea and increased sweating. Still, in carefully moderated doses, the extract was held to be of value

as an antitussive, "where in fact it gives many a patient a restful night and more peaceful day" when suffering from various ailments involving cough.

Sarracenia flava

Skipping ahead to 1974, "modern times," Miles et. al. (J. of Pharm. Sciences 63:613-615) reported on antitumor activity of various extracts of this species. The foreword to the paper describes how "moonshine" (ethanol, mostly one would hope!) extracts of this plant were used as a folk remedy among residents of southeastern Georgia in the Okefenokee region.

Testing was conducted in a highly controlled fashion against one tumor of the type known as epidermoid grown in tissue culture. Cruder extracts using methanol, water and chloroform indicated some antitumor activity. No preparations were active against at least two other kinds of cancers being grown in tissue culture (lymphoma and carcinosarcoma).

After further testing, extractions and isolations of various compounds, it was felt that betulin was the active principle in the results noted. Further testing of

various species, extracts and tumors might indeed be of interest since treatment of malignant tumors by chemicals is very prominent in today's medical armamentarium.

Summary

The early uses of our native CP in medicine are highly dubious by modern standards, although use of *Drosera* extracts for treatment of cough persisted into the 1930's. Still, many of our modern drugs were originally derived from plants and given the numbers of species of all plants in the world and the possible numbers of chemical substances in any of them, medically useful compounds might still be waiting undiscovered. This possibility is one more reason to encourage conservation of all our native plant stands in reasonable numbers consistent with civilization's demands, and also encouraging research toward successful cultivation and tissue culturing of all threatened species.



Sarracenia flava, Pensacola, FL