Conservation of Indigenous Medicinal Plants in Canada

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Abstract: Herbal medicine use is widely popular in Canada, in part because of growing interest in health promotion and folk healing in the general population, disenchantment with some biomedical therapies, and public awareness of herbal remedies due to advertising and media reports. Many therapeutic herbs are gathered from their natural habitats; few are widely cultivated. In addition, some consumers express a preference for 'wildcrafted' herbs, believing them to be more effective and less likely to be contaminated with agricultural chemicals than cultivated herbs. As a result, some wild populations of indigenous medicinal plants are at risk from overharvesting, just as wild echinacea, goldenseal, and American ginseng have been overexploited in the United States. In Canada, there is no formal system of accounting for medicinal plant harvesting, so little is known about which plants are being harvested, from where, and in what quantity. Few safeguards exist; individual species may be protected under the *Species at Risk Act* and under provincial Wildlife Acts, but such protection does not occur until plant populations are identified as being dangerously low. We propose a national system of regulation that includes (1) an enforceable legislative policy that protects wild plants from nonsustainable harvesting, both on public and private lands, (2) a monitoring and tracking system for all commercial harvesting of wild plants, and (3) a policy that encourages the propagation and cultivation of economically important medicinal plant species in order to reduce the harvesting pressure on wild populations.

Key Words: government regulation, secondary forest products, herbal medicine, medicinal plants, endangered species, wildcrafting, Canada

Introduction

Canada has recently begun to regulate its natural health products industry in a new way. The production and packaging of these products will be monitored in an attempt to assure good quality and accurate, informative labeling. Herbal medicines comprise the bulk of natural health products, which also include fungal or animal-based medicines, vitamins, minerals, amino acids, essential fatty acids, and probiotics. While herbal medicines are now monitored for quality, the harvesting of herbal medicines remains unregulated (Government of Canada 2001). Wildcrafted herbal products currently line the product shelves alongside farmed herbs. Yet, given the

popularity of a number of native or naturalized Canadian plants as herbal medicines, there is a clear need for a system of regulation and monitoring of wild harvesting.

Why are wild plants currently so popular in the sphere of herbal medicine? First, Canadians currently express a high level of interest in health promotion and folk healing in general, as well as disenchantment with some biomedical therapies. Second, there appears to be growing public awareness of herbal remedies due to advertising and media reports. Many of these therapeutic herbs are gathered from their natural habitats; few are widely cultivated. The third compounding factor is that some consumers express a preference for wildcrafted herbs, believing them to be more effective and less likely to be contaminated with agricultural chemicals than cultivated herbs.

In its Report of the Standing Committee on Health in 1998, the Canadian government acknowledged that medicinal wild plant collection lacked sufficient regulation, but it was mentioned only as a side issue in a chapter entitled "Other Issues" (Health Canada 1998). The report focused on the establishment of a regulatory body for the production and sale of herbal medicines. Rather than suggesting that wild harvesting of medicinal plants be monitored and regulated under Canadian law, the report recommended that "International Agreements that currently protect biological diversity are not violated and that additional strategies are developed if needed to prevent depletion of these valuable health resources" (Health Canada 1998). Consequently, the issue of domestic conservation became a matter for the Department of Foreign Affairs.

There are some obvious reasons for the neglect of environmental issues in the proposed regulatory policy. Firstly, the policy in question, which has been designed to regulate the natural health products industry, was based on the recommendations of a selected group of individuals. Practitioners, business people, and consumer groups were consulted (Health Canada 1998), while in the original rounds of discussions, other interest groups—including environmentalists—were not consulted. Secondly, there has been resistance on the part of some federal government officials to implement blanket policies on environmental issues. Indeed, in the words of a past federal minister of the environment, "entrenching employees' rights, environmental rights, and other bills of rights in areas of public policy… could very well undermine the capacity of elected and therefore accountable people to represent the public interests as they see fit" (Canada's Minister of the Environment, 1986 [Schrecker 1990]).

In this paper, we discuss several types of legislation that have the power to protect Canadian plants that are at risk from overharvesting. We then suggest how the situation could be improved by means of legislation that specifically targets medicinal plants.

Conservation of Medicinal Plants: A Forgotten Issue?

Canada's economy has traditionally been based upon resource extraction. Our economy has tended to rely on plentiful resources such as minerals, petroleum, forests, water, and fish.

Resource extraction has both a human cost and an environmental one. The human cost is typically paid by the residents of remote and northern areas whose backyards are most often the sources of these valuable resources. The environmental cost of resource extraction is also high, as most of these resources are not renewable. Those that are considered to be renewable, such as forests, are only renewable in the sense that forests will grow again where they previously stood; however, fragile ecosystems are often irreparably damaged by resource extraction. In other words, the commercially valuable resource (i.e., lumber) is renewable; the forest ecosystem may not be. This is the argument for strong legislative action.

Government rarely intervenes with this process until supplies dwindle, and even then, intervention is usually strongly opposed by industry as well as by the workers who rely on those raw materials to earn a living. Thus, in the case of medicinal plants and other 'secondary forest products', it is no surprise that they have heretofore received no legislative protection from the Canadian government. This is not merely a Canadian phenomenon. Around the world, many "species of medicinal and aromatic plant have had a notable feature in common, namely, that conservation efforts to protect them have begun only after they were already threatened by overexploitation" (TRAFFIC 1998a).

Indeed, it was not until 11 June 2002 that the Canadian government passed Bill C-5, creating what would be known as the *Species at Risk Act* (SARA) (Government of Canada 2002). This bill died twice on the order table in 1997 and 2000, and environmentalists in Canada were losing hope that threatened and endangered species would ever be protected by federal law. The bill, however, was finally proclaimed in 2003 (Government of Canada 2004).

SARA has some notable features: it aims to protect endangered and threatened species, to provide an avenue for their recovery, and to "encourage the management of other species to prevent them from becoming at risk" (Government of Canada 2002). SARA is supported by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), to which any individual can apply to have the status of a species assessed. Not only does the Act require the protection of listed species, it also allows for

- protection of critical habitat;
- monitoring and recovery strategies for listed species;
- enforcement officers and enforcement guidelines; and
- strict penalties for anyone who damages species that are listed under the Act.

For summary convictions of corporations, the maximum penalty is a CDN$300,000 fine; for those found guilty of an indictable offence, the maximum penalty is a CDN$1,000,000 fine. For individuals and nonprofit corporations, the maximum fines are CDN$50,000 for a summary conviction and CDN$250,000 for those found guilty of an indictable offence. Individuals also face the possibility of up to one year in jail for a summary conviction and five years in jail for conviction of an indictable offence (Government of Canada 2002).

Although SARA has a great deal of promise, its effect on the wild harvesting of medicinal plants may be minimal. Of the numerous plants currently listed as Endangered or Threatened under SARA, only two are of significant economic importance as plant-based medicines: goldenseal[1] (*Hydrastis canadensis* L. [Ranunculaceae]) and American ginseng (*Panax quinquefolius* L. [Araliaceae]).

American ginseng has been harvested nearly to extinction; it is listed as Endangered under SARA. It is our opinion that the hope for recovery of ginseng and other endangered species now lies in two areas: habitat protection and recovery strategies. While habitat protection and species recovery are allowed and even encouraged under SARA, no requirements or provisions are made for them. SARA will likely help ensure that wild harvesting of American ginseng comes to a standstill, although such harvesting is already nearly impossible given how few specimens of the plant can still be found in the wild.

In contrast, goldenseal can still be found in the wild. It is a key medicinal plant, both locally and in international trade. The plant is used primarily for its antibacterial properties, in spite of concerns about its effectiveness and potential toxicity (Small and Catling 1999). In the United States, at least 120,000 kg of goldenseal are harvested annually (McGuffin 1999). Commercial harvesting of this plant from the wild far exceeds what is produced through cultivation; only 2.4% of the goldenseal marketed in the United States in 1998 was from a cultivated source (McGuffin 1999). There is no record of how much goldenseal is harvested from the wild in Canada. Under SARA, goldenseal is listed as Threatened (Government of Canada 2003); this will ensure a moratorium on wild harvesting in Canada until such a time as the species has recovered enough to be delisted.

Goldenseal does not live alone in the wild. It coexists with a number of other plants, many of which have medicinal value, in a fragile eastern woodlands ecosystem. Some of its neighbors include bloodroot (*Sanguinaria canadensis* L. [Papaveraceae]), mayapple[2] (*Podophyllum peltatum* L. [Berberidaceae]), false unicorn[3] (*Chamaelirium luteum* (L.) A. Gray [Liliaceae], blue cohosh (*Caulophyllum thalictroides* (L.) Michx [Berberidaceae]), and black cohosh[4] (*Cimicifuga racemosa* Nutt [Ranunculaceae]). Like goldenseal, bloodroot is used for its antibacterial properties, particularly as an oral rinse (Small and Catling 1999), and is used as a topical treatment for skin cancer. Mayapple, used as a poison and a medicine, also contains anti-cancer agents. It is used topically to treat genital warts and some skin cancers. Extracts of mayapple are currently used in a number of anti-cancer prescription drugs (Small and Catling 1999). False unicorn is valued as a uterine tonic, and is believed to prevent miscarriage (Belew 1999). Blue and black cohosh are used primarily to treat gynecological disorders and as childbirth aids, although there have been reported cases of toxicity associated with the use of blue cohosh (Gunn and Wright 1996; Jones and Lawson 1998).

[1]NatureServe Explorer (version 4.0, July 2004) lists the common name of this species as golden-seal.
[2]NatureServe Explorer (version 4.0, July 2004) lists the common name of this species as may apple.
[3]NatureServe Explorer (version 4.0, July 2004) lists the common name of this species as devil's-bit.
[4]NatureServe Explorer (version 4.0, July 2004) lists this species as black bugbane (*Actaea racemosa*).

The United Plant Savers, a North American public interest group, lists goldenseal, bloodroot, black cohosh, and blue cohosh as species "at risk" of overharvesting for medicinal uses, and mayapple is listed as a species "to watch" (United Plant Savers 2001). All of the aforementioned plants are harvested for their roots and rhizomes, which are not renewable resources, unlike the aerial portions of the plants (Cech 1999). Once the root has been harvested, the plant will not return.

Wild medicinal plants are already threatened by land clearing and development, logging, and invasive weedy species. The herbal medicine trade is adding to the pressures on these plants. This is not just a Canadian problem; it is a worldwide trend, as many "medicinal and aromatic plant populations have already faced a deadly toll from a steady degradation of their natural habitats" (Schrecker 1990). Locally and globally, overharvesting hurts the environment, the industry, and the consumer as shortages drive prices up and increase the likelihood that products will be adulterated with other species (Brevoort 1998).

With SARA, there are two possibilities for protecting all of these species: one could apply to have each species listed as Threatened or Endangered, or one could apply to the government to have the eastern woodlands ecosystem protected under a management plan for goldenseal in order to also protect its valuable neighbors.

In addition to SARA, there are two other levels of legislation affecting Canadian plants: more locally, provincial Wildlife Acts, and globally, the Convention on International Trade of Endangered Species (CITES). Provincially, land can often be set aside as protected habitat for plants, animals, or ecosystems that are listed as Threatened or Endangered, but endangered plants are rarely offered any protection on private or Crown land. The provinces and territories have professed their commitment to protecting endangered species, as they all signed a *National Accord for the Protection of Species at Risk* in 1996; however, the Accord does nothing to protect endangered species in itself, but rather promises to "establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada" (Environment Canada 1996).

Internationally, certain plants are protected under CITES, although few of these plants are North American in origin. Only two native Canadian medicinal species are protected under CITES, and it is the same two species that will be protected under SARA: American ginseng and goldenseal (CITES 2000). Only the whole or sliced roots are covered under CITES; processed parts and derivatives are exempt (CITES 2000). Even this protection contains a loophole: "Under Appendix II commercial trade is permissible, provided specimens of listed species are harvested in a legal and biologically sound manner and valid CITES documentation is obtained prior to shipping" (Robbins 2000). The role of CITES is to offer "a safety net for overexploited species, while giving countries belonging to the Convention an opportunity to develop management measures for the continued utilization and long term conservation of exploited fauna and flora" (Robbins 2000).

Unfortunately, the Convention relies heavily on the cooperation and monitoring efforts of its member countries, and it has no jurisdiction over trade occurring within national boundaries. The onerous task of tracking the trade of endangered plant and animal species is accomplished by nongovernment organizations such as TRAFFIC (the wildlife trade monitoring arm of the World Wildlife Fund) and The Nature Conservancy (King et al. 1999).

In addition to the problems noted above, SARA, CITES, and provincial Wildlife Acts all have a common weakness: they target individual species, which tend to be 'noble' species (the large and the beautiful). This approach does little to protect ecosystems, less prominent species, or species which may be globally abundant but locally threatened. It is also unable to respond quickly to changing patterns of resource use.

Policy Recommendations

Given the importance of medicinal plants for human health, the Canadian government has an obligation to help protect these plants from overharvesting. Considering its past approach towards the protection of endangered plant species, it seems unlikely that the federal government will intervene to regulate the harvesting of wild medicinal plants as a whole. Rather, individual species will probably be protected as they near extinction (TRAFFIC 1998b). That being said, the Canadian government's potential role is threefold.

First, Canada requires an enforceable legislative policy that protects medicinal wild plants from nonsustainable harvesting on both public and private land. Not only will the environment suffer from nonsustainable harvesting, in the long run, the economy will suffer as the supply of resources diminishes. We consider medicinal plants to be especially worthy of specific legislation as they are in particularly high demand (as compared to nonmedicinal species), and have a unique intrinsic value to human beings. If they are not protected from overharvesting, human health may eventually suffer as invaluable medicinal species disappear.

Second, a monitoring system is needed for all commercial harvesting of wild plants on both public and private property. In the absence of such a system, it is difficult to estimate how much wildcrafted medicinal plant material is produced, and the ecological impact of that harvesting will be recognized too late.

Third, the federal government should initiate a policy that encourages the propagation and cultivation of economically important medicinal plant species in order to reduce the harvesting pressure on wild populations and to promote the development of continuous sources of quality-controlled medicinal plants. This ought to include, as much as possible, plants that are imported for medicinal use as well as those that are found locally. Federal grants, loans, and tax incentives could all be used to encourage sustainable economic development in the area of medicinal plant cultivation. This would enable agriculturalists to diversify their crop bases, encourage academic research in new crop propagation, cultivation, and breeding, and allow for the reintroduction of

cultivated native plants into areas where they are now locally extinct, which would benefit both the economy and the environment.

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