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LEARNING NEW MEDICINES:  
EXCHANGING MEDICINAL PLANT KNOWLEDGE  
AMONGST NORTHWESTERN NORTH AMERICAN  
INDIGENOUS AND SETTLER COMMUNITIES

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SUMMARY

*Virtually every human society holds a rich body of knowledge regarding herbal medicines. Through a study of medicinal plants used by Indigenous peoples in Northwestern North America, as well as plant names and medicinal applications, I investigate the ways in which such knowledge is acquired and shared across cultural and geographic space. Not only are there many similarities in medicinal plant traditions among the region's Indigenous cultures, there is also evidence of exchanging medicinal plant knowledge – and even the medicines and plants themselves – between newcomer Europeans and Asians and Indigenous peoples. As well as introducing their own herbal medicines from their homelands, the newcomers acquired herbal medicinal knowledge from First Nation practitioners, adapted this knowledge to their own needs, and incorporated it into their official pharmacopoeias. This process of medicinal knowledge transmission can enrich our lives and increase our resilience in the face of ongoing change.*

*Introduction*

In the language of the Haida Indigenous peoples of British Columbia, Canada, the name for tall buttercup (*Ranunculus acris* L.) is *daktaa xilGa* (Skidegate dialect), derived from the English word “doctor”

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and the Haida word *xil*, a term that means, simultaneously, both “leaves” and “medicine”<sup>1</sup>. This species (Fig. 1) was introduced from Europe and is now a fairly common plant of disturbed areas on Haida Gwaii<sup>2</sup>. Buttercups and various other plants of the buttercup family (Ranunculaceae) are widely used as counter-irritants in indigenous medicine, containing particular compounds, protoanemonins and their derivatives, that cause blistering and irritation of the skin<sup>3</sup>. For the Haida, as the late Haida elder Florence Davidson said, “*xil k’anhlahls poisen gáageng*” (“buttercups are poisonous”)<sup>4</sup>. However, application of an irritant to the skin to relieve underlying muscular or joint pain was a well known and widely used practice



Fig. 1. Tall buttercup (*Ranunculus acris* L.), known as *daktaa xilGa* (“doctor leaves/medicine”) by some Haida, an example of a borrowed medicine tradition from Europe being incorporated into Indigenous traditional knowledge.

among Haida and other Indigenous peoples of North America, as well as in Europe and elsewhere. It is not surprising, therefore, that the Haida would have embraced this new, introduced plant and its use as a counter-irritant, as one of the many plant species incorporating the term *xil* ('leaves/medicine') into the name<sup>5</sup>. This is just one of many examples of how new terms, new plants and new knowledge are readily integrated into people's languages and cultures<sup>6</sup>. It also illustrates one avenue by which a group of people expands and adapts its medical traditions over time.

In this chapter, I briefly introduce the study region of northwestern North America and the Indigenous peoples who reside here. I then provide a background of research approaches and relevant literature on the topic of ethnobotanical knowledge acquisition and exchange. I identify evidence for and key examples of how medicinal applications have been shared both among Indigenous communities and between Indigenous peoples and newcomers to North America, mainly Europeans. Following this I discuss the implications of the sharing of such knowledge as a part of cultural adaptation and resilience.

#### *Indigenous Peoples and Ecosystems of Northwestern North America*

Northwestern North America – the region from the Columbia River north to central Alaska and east to the Rocky Mountains – has been home to dozens of Indigenous cultural and language groups for thousands of years, starting at the end of the Pleistocene glacial period<sup>7</sup>. Altogether, about 50 different languages and major dialects are spoken throughout the region, classified within several language families: Na-Dené (including numerous Dene, or Athabaskan, languages, as well as Tlingit and Eyak), Ts'msyenic (Tsimshian), Wakashan, and Salishan, along with linguistic isolates, Haida and Ktunaxa. A total of about 270 indigenous plant, algae and fungi species are named in two or more of these languages. Most of these named plants are used as sources of food, materials, and/or medicines and many have piv-

otal roles in social and economic relations, stories, and ceremonies. Many of the species grow in specific habitats, some at a considerable distance from villages, and people would frequently travel some distance to obtain them. In the past, even young children would have been familiar with many plants, their names, applications and where to find them<sup>8</sup>.

The region includes approximately 20 major vegetation zones, varying with topography, elevation and latitude. Most of these are forested: the maritime forests along the west coast at lower and higher elevations, the boreal and sub-boreal forests, interior dry forests, and interior wet belt forests, and interior high elevations forests, as well as alpine, tundra and interior dry grasslands. Each has its own complement of habitats, successional stages and associated species. In all, there are approximately 2,500 native vascular plant species in the region, as well as a diversity of marine algae, fungi, lichens and bryophytes. Species range from widespread and cosmopolitan to endemics of more restricted range and habitats. Only a fraction of the total flora – some 200 species – have been recorded as being used as medicines by one or more groups of people in the region, but, significantly most of these are used by more than one group, and some are used throughout the entire region.

#### *Methods and Literature Sources*

Information for this chapter was drawn from my own field research, working with Indigenous plant and medicine specialists over the past 45 years, and documenting the names, applications and relationships with plants that are a key part of people's cultural knowledge systems. Standard methods in collaborative ethnobotanical documentation – first-hand interviews, workshops, field outings, participant observation, and reviews of existing ethnographic and historical literature and documents – have all been part of these studies. Specific methods, including obtaining informed consent from par-

ticipants, many of whom were co-authors of publications relevant to this study, are described in my recent book, along with an associated online database of plant names in the different languages of the region to which I refer in this analysis. This book also cites a number of key sources of information on medicinal plants<sup>9</sup>. Of particular importance in this work are various compendia of ethnobotanical and ethnomedical research from across North America and beyond<sup>10</sup>.

### *Acquiring Medicinal Plant Knowledge*

Using medicinal plants must be as ancient as humankind. We know that other primates and other animals such as bears also treat themselves with plant medicines<sup>11</sup>, and it is likely that Neanderthals and other ancient peoples would have experimented with and discovered effective healing plants, as they did different food sources<sup>12</sup>. Those observed to be effective would have been adopted and shared with others. The taste and scent of particular plants and plant substances would have offered clues about their potential application, and invited experimentation, and the more their efficacy was demonstrated, the more intensive and widespread their use would become, to the point where the plants themselves, their preparation and application would become valued information, and a key component of a complex and ever changing body of knowledge, practice, belief, and wisdom that comprises any group's traditional knowledge system.

The example of Haida use of an introduced buttercup species as a counter-irritant medicine reflects the transference of both a species from a distant place and its associated knowledge from one group, or perhaps one individual, to another. This is just one way in which medicines have been routinely shared. More common and widespread is the sharing of knowledge of medicines – as with foods and materials – within families and communities during the course of day-to-day life, from parents, grandparents, aunts and uncles, to children, out on the lands and waters of a people's territory, and

especially when the need arises to gather a particular medicine or group of medicines due to illness, accident or childbirth.

Not all knowledge related to medicinal plants is treated in the same way. While all plants and medicines are generally considered in Indigenous North American cultures as sacred and as having spiritual dimensions and sentience, and thus deserving of deep respect and gratitude, some plants and medicines are regarded as particularly powerful. Some have been revealed to the knowledge holder in the form of dreams, or sometimes passed on by particular individuals in special circumstances. In some cultures, the efficacy and power of such plants is often believed to diminish if their medicinal use is widely known. The use of these special medicines, and especially the ceremonial words of thanks and prayer addressed to them as they are collected, prepared and administered, is considered private knowledge, not to be shared with anyone, even within a family. These protocols are stricter among some groups than others. Recently for some knowledge holders, even when past conventions have prohibited sharing medicine, concerns that their medicinal plant knowledge may be lost because it is not being passed on in the traditional ways have encouraged disclosure of medicines that may have formerly been kept secret<sup>13</sup>.

There are also different types of healing, depending upon the particular ailment being treated, whether a physical injury or illness or seen as having a supernatural cause. The latter, more in the psychological realm, would be treated by shamanic practices, and although these involve the use of plants, magical or shamanic healing tends to draw on objects from the supernatural realm and is generally within the practice of specially trained shamans. Physical ailments or injuries, on the other hand, would usually be treated, at least at first, by herbal specialists, often older women who had acquired healing traditions through interest, aptitude and special training. As explained by ethnographer James Teit, for the Secwepemc (Shuswap): "As among

the Thompson [Nlaka'pamux] people, a large number of herbs were used as medicines; and when people got sick, they at first resorted to them for remedies. If they failed to do good, it was thought something was wrong with the soul, and a shaman was called"<sup>14</sup>.

Training in herbal medicine could be both informal and formal. Often, children would be carefully instructed from an early age to collect particular medicines for their grandparents or other elders, although they might not know how these plants would be prepared and administered. As they matured, if they showed an aptitude for healing practices, they might be taken on as an apprentice by a healer, and, in turn, they would learn about the plants and their applications and become specialists themselves. Not only the identification of plants and their medicinal applications, but an understanding of diseases and ailments, as well the protocols of harvesting, preparing and applying the treatments constitute the training of herbalists. Again, the spiritual dimensions of healing and of medicinal plants are critical areas of education for herbalists; the plants and medicines required careful and respectful treatment to be fully effective.

Through intermarriage or other ties of kinship or exchange, people would – and still do – bring medicinal plant knowledge and practices, and in some cases the medicines themselves, with them to a new community, and this is a primary way by which such knowledge is spread more across cultural, linguistic and geographic space. For example, it was a common practice for a woman to marry outside of her own group, and to move to her husband's village, maybe into a new language area. She (and likely her children too) would then become bilingual, and she would be the one who facilitated the introduction of new plants, new names and new uses of plants to her husband's community. In-laws were also often conveyers of such knowledge during family visits and exchanges. On a broader scale, similar exchange occurred with the immigrant populations of settlers, in cases where friendships and intermarriage took place – such as between the

French Canadian voyageurs and Cree and other Indigenous women, whose descendants, the Métis people, are holders of a special blending of Indigenous and European medicinal plant knowledge<sup>15</sup>.

*Medicinal plant knowledge exchange*

There are many interesting examples of Indigenous North American medicinal plants whose applications are widely known and whose use must have diffused, at least to some extent, across cultural, linguistic and geographical boundaries, by word of mouth, through intermarriage or some other type of intergroup communication. Some of these are undoubtedly very ancient, possibly dating back to the time when First Peoples arrived on the continent, or even before. For example, *Artemisia* species (sagebrushes, or wormwoods, e.g. *A. tridentata* Nutt., *A. frigida* Willd., *A. tilesii* Ledeb., *A. dracunculoides* L.) are widely known and applied to treat respiratory ailments, colds and coughs among many other medical problems. Their applications must have been discovered very early and shared repeatedly over millennia, as with some other aromatic plants such as yarrow (*Achillea millefolium* L.) (Fig. 2)<sup>16</sup>. Willows (*Salix* spp.), alders (*Alnus* spp.), junipers (*Juniperus* spp.), spruces (*Picea* spp.), pines (*Pinus* spp.) and cottonwoods (*Populus* spp.) are likewise used in similar ways by dozens of different Indigenous groups and would probably have been known as medicines by the earliest peoples, perhaps even by Asian ancestors before North America was inhabited<sup>17</sup>. Table 1 lists some examples of widely used medicines – plants whose applications are similar and may well have been discovered and shared in ancient times.

From the 20<sup>th</sup> Century on, the opportunities for exchanging medicinal plant knowledge increased, with new medicines being acquired from the expanded circle of social contacts that resulted from development of agricultural centres and canneries and contact with immigrants and other First Nations. For example, Saanich elder Elsie Claxton (pers. comm., 1992) and Stl'at'imx elder Edith O'Donoghue both recalled that their





Fig. 2. Yarrow (*Achillea millefolium* L.), one of the most widely used herbal medicine plants, known to capitalize indigenous peoples throughout North America as well as in European and Traditional Chinese medicine.

people learned about the use of oceanspray (*Holodiscus discolor* (Pursh) Maxim.) fruits to treat dysentery and diarrhoea from the Yakima people when they travelled to eastern Washington to pick fruit around the 1930s and 1940s<sup>18</sup>. Similarly, the use of sweetgrass (*Hierochloa hirta* (Schrank) Borbas) was said to have been shared with the Nuxalk of Bella Coola by visiting Alberta Indigenous people, possibly Siksikaititapi (Blackfoot), who visited the coastal community some time in the mid 20<sup>th</sup> Century (S. Brown, pers. comm. 2016). Many contemporary gatherings, such as the annual All-Native Basketball tournament in Prince Rupert, include stalls that sell prepared medicines, such as devil's (Devil's - Club) club (*Oplopanax horridus*) ointment or spruce pitch (*Picea sitchensis* (Bong.) Carr.) salve, making these more widely available.

Table 1. Examples of medicines that were likely discovered and widely shared among Indigenous Peoples of northwestern North America over many millennia; most have names in multiple languages (General references for this table: Duke J., 1985; Moerman D., 2003; Marles R. et al., 2000; Smith HI, 1928; Turner NJ., 2014, Chapter 7; Turner N, Hebda R., 1990)

Plant Medicine	Notes on common applications
“Balsam” firs: grand fir, silver fir, subalpine fir ( <i>Abies</i> spp.; Pinaceae)	Bark and/or pitch from blisters and/or boughs; pitch has known antibiotic properties; highly aromatic; known as “medicine tree” in Interior Salish languages; administered as tea, salves, incense, and inhalant; pitch taken mixed in hot water to treat coughs, colds, influenza, and tuberculosis
Yarrow ( <i>Achillea millefolium</i> L.; Asteraceae)	One of the most widely used medicinal herbs in the world; aromatic; a “panacea” with over 100 identified pharmacologically active compounds; leaves, roots, or whole plant used; administered as tea, poultice, inhalant; used to treat bleeding, insect bites, wounds, skin infections, toothache; tea drunk as tonic, blood purifier, for colds and coughs, for stomach and digestive tract ailments; used by women during labour and for numerous other purposes
Red alder ( <i>Alnus rubra</i> Bong.; Betulaceae) and related spp.	Bark has strong antibiotic properties; solution used as a skin wash, for infections, rashes; tea drunk for tuberculosis, stomach problems
Kinnikinnick ( <i>Arctostaphylos uva-ursi</i> (L.) Spreng.; Ericaceae)	Leaves widely known as smoking substance; contain glycosides; leaves used; prepared as tea; tea drunk as blood tonic, for kidney problems and urinary tract infections and other purposes; infusion as a wash for burns (The practice of smoking leaves was evidently learned from Algonkian peoples, then brought by traders across to western North America: Marles R. et al., 2000; Turner NJ, Szczawinski AF. 1978)
Wild ginger ( <i>Asarum caudatum</i> Lindl.; Aristolochiaceae)	Leaves and rhizomes spicy and aromatic; used as a purifying wash and “good luck” medicine; infusion drunk as a tea, used in bath water; later sold in pharmaceutical industry
Red-osier dogwood ( <i>Cornus stolonifera</i> Michx.; Cornaceae)	Shredded inner bark used to make a poultice for swellings and bruises and toothaches, and a tea from the twigs drunk as a cleansing tonic
Rattlesnake plantain ( <i>Goodyera oblongifolia</i> Raf.; Orchidaceae)	Inner leaves used as a poultice for cuts, burns, blisters, boils, and rheumatic pains; leaves used as childbirth medicine; also valued for spiritual protection

*Exchanging Medicinal Plant Knowledge in NW N America*

Seaside and Rocky Mountain Junipers ( <i>Juniperus maritima</i> R.P. Adams, <i>J. scopulorum</i> Sarg.; Cupressaceae)	Interior Salish name, “ <i>punlhp</i> ” one of the most widely distributed plant names for these groups; aromatic branches used to make a medicinal tea for digestive tract, respiratory diseases, high blood pressure, childbirth, arthritis, muscular aches; drunk in sweat-house for ritual cleansing and purification, for luck and protection; protective wash for hunters, bereaved people; boughs burned or steamed for household “disinfectant” and fumigant at times of illness and death; cleansing wash for clothing, walls, and bedding
Canby’s lovage, or <i>yi’ut</i> ( <i>Ligusticum canbyi</i> (J.M. Coult. & Rose) J.M. Coult. & Rose; Apiaceae)	Root administered as scent; used as a poultice for cuts and burns; chewed or made into a tea, to treat colds, coughs, sore throat, toothache, tuberculosis; also smoked or chewed as a relaxant; considered prophylactic; used like “smelling salts” to revive people in a trance; a highly spiritual medicine, related to <i>osha</i> ( <i>L. porteri</i> ), a well-known medicine of Rocky Mtns and Sierra Madre
“Wild celery,” or Indian consumption plant ( <i>Lomatium nudicaule</i> (Pursh) J.M. Coult. & Rose; Apiaceae)	Aromatic seeds chewed or used as a tea to treat colds, sore throats, tuberculosis; also burned as an incense or wash to disinfect and purify a house; a highly spiritual medicine; widely known as “ <i>qexmín</i> ” or variants by many coastal groups
Field mint ( <i>Mentha arvensis</i> L.; Lamiaceae)	Aromatic leaves and tops used by as a tea and inhalant, to treat colds, fever, pains, swellings, colic in children, and “summer complaint” (headache, bleeding nose – sunstroke); drunk as a general tonic to maintain “good health”; used as an eyewash for sore eyes
Devil’s-club ( <i>Oplonax horridus</i> (Sm.) Miq.; Araliaceae)	One of the most widely used of all medicines; tea of inner bark used to treat arthritis and rheumatism, stomach ulcers, and various internal ailments; taken ongoing as a tonic; now taken in the form of tea or capsules to treat diabetes; a strongly spiritual medicine with strict protocols around harvesting and preparation
Lodgepole pine and ponderosa pine ( <i>Pinus</i> spp.; Pinaceae)	Bark and pitch of these species used by many groups; pitch salve used to treat burns, swellings, wounds, infections; tea of boughs drunk as tonic (but not for pregnant women)
Sitka spruce, Engelmann spruce and white spruce ( <i>Picea</i> spp.; Pinaceae)	Bark and pitch of these species used many groups; gum chewed as breath freshener, and for colds, coughs, and tuberculosis; said to whiten teeth; tea from pitch drunk as tonic; pitch salve used to treat burns, wounds, infections; tea from inner bark applied to rashes, eczema, and sores, and drunk as a tonic; tea from boughs used as a disinfectant on floors to keep illness away; strongly spiritual medicine

Licorice fern ( <i>Poly-podium glycyrrhiza</i> D.C. Eaton; Polypodiaceae)	Rhizomes chewed as mouth freshener, sweetener for medicines and appetite stimulant; also chewed or used as tea for coughs, colds, sore throats, whooping cough; widely used on Northwest Coast
Cottonwood ( <i>Populus balsamifera</i> L.; Salicaceae)	Resin from buds mixed with animal fat (now Vaseline) to make a salve for sunburn, cuts, sores, eczema, for teething babies and toothache; leaves used as a poultice to draw out infection
Cascara ( <i>Rhamnus purshiana</i> DC.; Rhamnaceae)	Bark widely used as a laxative medicine, general tonic and digestive aid; prepared as a tea of varying strengths; readily adopted into the settlers' pharmacopoeias
Labrador tea ( <i>Rhododendron groenlandicum</i> (Oeder) K.A. Kron & W.S. Judd; Ericaceae)	Leaves (and flowers) used to make a tea, which was also considered to be a tonic and was drunk for colds and influenza; widely used in nw N America, but the notion of use as a beverage tea possibly introduced from eastern Indigenous peoples via Hudson's Bay employees
Willows ( <i>Salix</i> spp.; Salicaceae)	Leaves, shoots, and bark used as poultice for cuts, wounds, and sores; infusion of leaves and bark drunk for coughs and colds
Elderberry ( <i>Sambucus racemosa</i> L.; Caprifoliaceae)	Bark applied as poultice for boils and infections; infusion of bark drunk to hasten childbirth during prolonged labour, and as purgative and emetic
Soapberry ( <i>Shepherdia canadensis</i> (L.) Nutt.; Elaeagnaceae)	Berry whip eaten as "health food", and for colds and flu; decoction or infusion of branches and leaves drunk as tonic, to relieve pain for headaches and sore areas, and as a purgative and laxative; used in ritual purification by hunters and young men at puberty
False hellebore, or "poison root" ( <i>Veratrum viride</i> Aiton; Melanthiaceae)	Highly toxic alkaloid-containing plant whose rootstocks are widely known, and used externally as an analgesic, snuffed for colds, and as an incense; taken internally in very minute amounts or in diluted form as an emetic and purgative; strong spiritual qualities for protection and purification.

There are also many examples of medicinal plant knowledge exchange between European colonists and North American Indigenous Peoples, over centuries of contact<sup>19</sup>. In some cases, the exchange has been direct and personal, as when French explorer Jacques Cartier and his crew ventured up the St. Lawrence River in 1524. Forced to over-winter at "Hochelaga," near what is now the City of Montreal, Cartier and his men, icebound, were suffering terribly from scurvy (Vitamin C deficiency). The local Indigenous people brought

an Eastern white cedar (*Thuja occidentalis* L.) out to the ship and showed the weakened and dying men how to make an antiscorbutic tea by boiling the bark and foliage, thereby saving all who partook of it from a terrible death. This tree became Cartier's *arbre de vie*, or "tree of life"<sup>20</sup>. Medicinal remedies were, like Indigenous foods, often critical to the survival of European newcomers, and many were readily adapted to their own needs and became the basis of a widespread pharmacopoeia of herbal medicine. Some of these included *Echinacea* spp., goldenseal (*Hydrastis canadensis* L.), bloodroot (*Sanguinaria canadensis* L.), mayapple (*Podophyllum peltatum* L.), and saw palmetto (*Serenoa repens* (Bartr.) Small) – all well known herbal medicines originally used by Indigenous peoples<sup>21</sup>. Introduced livestock, especially horses, also received treatment with Indigenous herbal medicine.

The close relationship between food and medicine has also featured in the expansion of medicinal plant use. For example, the root bark and leaves of sassafras [*Sassafras albidum* (Nutt.) Nees] were being used by Anishenaabe, Iroquois and other Indigenous peoples of eastern North America for a beverage tea and to season cooking meat and other foods when the Europeans first "discovered" it in the 16<sup>th</sup> C, during Spanish explorations of Florida, and mistook it for cinnamon. The bark was imported to Europe as a medicine, and in North America it was adopted as a tea by settlers throughout its range and used to flavor root beer<sup>22</sup>. Other "medicinal" tea plants adopted by Europeans and other newcomers to North America include wintergreen (*Gaultheria procumbens* L.), New Jersey tea (*Ceanothus americanus* L.), yaupon tea, or "cassina" (*Ilex vomitoria* Sol. ex Aiton), and yerba buena (*Clinopodium douglasii* (Benth.) Kuntze), as well as the famous antiscorbutic spruce beer, from the boughs of black spruce (*Picea mariana* (Mill.) Britton) and other conifers<sup>23</sup>. Indigenous plant medicines from northwestern North America that have been adopted by settlers and other newcomers, and incorpo-

rated more broadly into the North American pharmacopoeia include wild ginger (*Asarum caudatum*) (Fig. 3), Oregon-grape (*Mahonia* spp.), devil's-club (*Oplopanax horridus*) (Fig. 4), cascara (*Rhamnus purshiana*), and false hellebore (*Veratrum viride*)<sup>24</sup>. Nlaka'pamux plant specialist Annie York recalled how the local Chinese people used wild ginger leaves (*Asarum caudatum*) as a poultice for cuts and sprains, and one of the names she used for this plant was "Chinaman's medicine"<sup>25</sup>. Wild ginger and other wild medicines, including devil's-club and sarsaparilla (*Aralia nudicaulis* L.) were collected by First Nations harvesters and sold to buyers from pharmaceutical companies<sup>26</sup>. In particular, many of today's elders remember earning money as children and youth by harvesting and selling cascara



Fig. 3. Wild ginger (*Asarum caudatum* Lindl.), UBC herbarium collection, label reads: "The aromatic root of wild Ginger is collected in autumn, and the price ranges from 10-15 cents a pound. It is used as an aromatic, diaphoretic, and carminative." (UBC Herbarium, 30/4/1896).



Fig. 4. Devil's-club (*Oplopanax horridus* (Sm.) Miq.), an extremely important medicinal plant, attributed strong spiritual protective qualities, used by Indigenous Peoples virtually throughout its range to treat a multitude of ailments, including, most recently, diabetes. In the ginseng family (Araliaceae), it has been incorporated into the general North American pharmacopoeia.

bark to buyers for drug companies; one elder recalled harvesting this medicine as a very young child and paying for his hunting ammunition with the proceeds. In the 1930s, the price for cascara bark was about twenty cents per pound<sup>27</sup>. Secwepemc (Shuswap) harvesters used to sell “balsam pitch” (spruce gum and fir gum) to local pharmacists for use in their pharmaceutical preparations<sup>28</sup>.

Perhaps the best-known “modern” medicine deriving from a native medicinal plant in this region is the anti-cancer drug taxol, or paclitaxel, originally isolated from the bark of Pacific yew (*Taxus brevifolia* Nutt.). Taxol was identified during a National Cancer Institute

study, initiated in 1958, to screen some 35,000 plants for anticancer activity, and was brought to market by Bristol-Myers Squibb in 1993. This drug was not derived directly from Indigenous Peoples' knowledge, yet this tree has multiple layers of cultural importance for First Nations, and some have been using the wood and bark for medicinal teas, to treat rheumatism and internal illnesses and even for heart problems and cancer, for countless generations. Originally the production of taxol required cutting down immense quantities of Pacific yew to produce minute amounts of the drug, and the loss of so many of these rather uncommon trees was of great concern to Indigenous healers, many of whom also considered that their own medicinal tree was being stolen from them. Fortunately, researchers developed ways of synthesizing taxol from related compounds found in English yew and other *Taxus* species, so the potential conservation crisis was averted<sup>29</sup>.

Conversely, as with the Haida and the buttercup example cited at the beginning of this chapter, native North Americans also learned about new remedies from the newcomers, who brought many species from Europe and elsewhere that were adopted into the diets and medicinal knowledge systems of Indigenous peoples. For example, horehound (*Marrubium vulgare* L.) was introduced into California and, "Where introduced and where the Indians came in contact with the white settlers, they used it in a like manner for colds and to stop diarrhea"<sup>30</sup>. Early on, Indigenous people in the northwestern region incorporated introduced species such as broad-leaved plantain (*Plantago major* L.), common dandelion (*Taraxacum officinale* (L.) Weber ex F.H. Wigg.), and pineapple weed (*Matricaria discoidea* DC) as medicines. Broad-leaved plantain is widely recognized as an effective poultice for burns, stings, boils and other infections. Dandelion, as well as producing edible greens, has a milky latex in its stems that is widely used as a remedy to eliminate warts, and roots that are considered to be a good general tonic when chewed. Pineapple weed



was admired for its sweet, chamomile-like scent. Plant specialist Dr. Mary Thomas of the Secwepemc Nation recalled this last plant with great fondness: “It’s got a beautiful smell.... My mother always had a great big bag picked, and dried and used it for tea [good for the heart; thins the blood]. They would boil water and put a handful of this and steep it and when it was steeped she’d take it and mix it in cold water with soopolallie (*Shepherdia canadensis*) juice for a [healthy] summer drink....”<sup>31</sup>.

The epidemic diseases that were introduced from Europe and elsewhere – smallpox, measles, tuberculosis and venereal diseases – were treated with existing indigenous medicines such as *qexmín* (*Lomatium nudicaule*), and devil’s-club (*Oplopanax horridus*), whose applications were expanded accordingly. *Qexmín* became known as “Indian consumption plant,” based on its new application. New diseases were also combatted with various new medicines, and vaccines, brought by the newcomers<sup>32</sup>. By the 20<sup>th</sup> Century, Indigenous people were frequently receiving western medical treatments, and European-style patent medicines sometimes replaced traditional medicines if the latter did not seem to be effective<sup>33</sup>. The use of indigenous medicines expanded, too, as new ailments presented themselves. Devil’s-club, widely used originally by Indigenous peoples to treat arthritic pain, as a purgative and as a spiritual protective medicine, began to be used to treat diabetes, an application that is today quite widespread among First Nations. This use was apparently adopted from white settlers, such as those at Bella Coola<sup>34</sup>.

More recently, many of the “generic” herbal medicines such as cayenne pepper (*Capsicum annuum* L. ‘cayenne’), burdock (*Arctium lappa* L.), valerian (*Valeriana officinalis* L.), St. Johnswort (*Hypericum perforatum* L.) and mullein leaves (*Verbascum thapsus* L.) have become well known to many Indigenous herbalists, some of whom may not be aware that these originated from Europe rather than from their own medicine traditions in North America.

*Discussion*

The previous section presents examples of sharing of medicinal plants and their uses, but sometimes the directions and pathways of knowledge discovery are not possible to detect. The medicinal qualities of some plants may have been determined over and over again, or the transmission of knowledge about them may simply be obscured in the mists of time. (This may well be the case for potent medicines such as the *Artemisia*, *Mentha*, *Achillea*, *Oplopanax* and *Veratrum* species.) However, there are sometimes clues to the direction and antiquity of the knowledge exchange, for example, based on oral traditions: many of today's elders remember the circumstances under which they learned about particular medicines, either having harvested the medicines for others, received the medicine as a treatment, or witnessed its application to others. For example, Nlaka'pamux elder Julia Kilroy recalled from her childhood, during the 1918 flu pandemic, how her grandmother insisted that everyone in her family drank nothing but tea made from the native mint, *Mentha arvensis*. She declared, "*We didn't get sick that time, but everybody [else] did. Sick and dead... [This mint] must be a good medicine.*" That memory of the use of mint stayed with her over her lifetime and she passed that along to many others<sup>35</sup>. Another Nlaka'pamux elder, Annie York, was injured in a bus accident as a young woman. Her aunt, who was trained as a traditional herbalist, treated Annie's back with a poultice of the highly toxic water-hemlock (*Cicuta douglasii*), which gave her considerable relief. Annie, as a plant specialist herself, easily recalled these and other medicinal plants that she had observed being administered<sup>36</sup>.

Commonalities in names for medicinal plants, similarities in recipes used and combinations of medicinal products, or similar modes of preparation and administration are all indicators of shared knowledge. A good example of common names reflecting shared knowledge is the Nlaka'pamux and WSÁNEC' names for Indian-pipe

(*Monotropa uniflora*), a saprophytic plant used to treat sore legs and skin sores that would not heal. The names *sq'awm pet tkéy'* and *shiwə? ʔə tʰ stqeyə?* both translate as “wolf’s urine”. All of the species listed in Table 1 share names among different languages, in some cases across language families – and indication that names were “borrowed” from one language group to another, probably along with traded products or medicinal information about the plant named. Similarities in the ways in which medicinal plants are harvested and prepared, and even in the combinations of species used in particular recipes by different groups, also reflect exchange of knowledge across geographic and cultural boundaries.

Genetic comparisons and disjunct plant distributions may also reveal some information, in the case where medicinal plants might have been transplanted from one area to another. For example, the active sharing of medicinal plant knowledge is also supported by populations of plants that are disjunct, or associated with settlements. In 2012, we found a population of sweetflag (*Acorus americanus*), a well-known medicine for Cree and other boreal forest peoples<sup>37</sup>, growing in the estuary of the Salmon River beside Shuswap Lake. Since sweetflag, a blue-listed species for British Columbia, is not common in this region, and since it is known to have been transplanted along trade routes across Canada, it is likely that this population was transplanted to Shuswap Lake for its medicinal use; genetic fingerprinting might confirm this hypothesis.

Despite the long-standing patterns of exchange of medicinal plants and applications across cultural, linguistic and geographic boundaries, there are some major considerations to be addressed, especially at the intersection of Indigenous and “western” approaches to medicinal plant use. For many Indigenous peoples, there is a strong belief in the spirituality of the plants and the medicines derived from them. The idea of harvesting the plants without proper protocols, of refining and analyzing them for their active ingredients, or com-

mercializing them, is abhorrent. Some people stress, “Our medicines are for healing, not for sale.” In general the medicines are regarded as one part of a holistic healing that involves lifestyle, reciprocity, and gratitude to the spirits of the plants and to the Creator. Keeping the ingredients of medicinal preparations secret and private is often considered to be important in their effectiveness, although many have obviously been willing to share their medicines and even their recipes in the interests of well-being of others.

In western medicine, although the pharmacological properties of various herbs are recognized, the general approach is to refine them and extract the active principles, as in the development of the alkaloid taxol from Pacific Yew as a cancer treatment drug. Even further, these drugs, when possible are synthesized for mass production, bypassing the need for the original plants altogether. Salves, tinctures and other preparations incorporating indigenous herbal medicines are commonly marketed, in herbal shops, local markets and through the internet. For example, a quick web survey revealed that [www.amazon.ca](http://www.amazon.ca) and [www.ebay.ca](http://www.ebay.ca) both offer dozens of herbal products, from cascara to balm of gilead, to wild ginger, for sale.

There is also concern among Indigenous healers about conservation of their medicinal plants. There are so many threats to forests and native plants in general, the idea of massive harvests for commercial medicine production is widely opposed. Experience with overharvesting of cascara, wild ginger, and most recently, Pacific yew trees has demonstrated that this is not an idle worry. Indigenous harvesters in the past have always followed strict protocols for protecting the medicines from over exploitation. For example, tree bark used for medicine is routinely harvested as a narrow rectangular strip from the trunk, leaving a scar that will eventually heal over – as demonstrated by many examples of culturally modified medicine trees (CMTs) to be seen in coastal forests (Fig. 5). Roots, leaves, and branches are harvested sparingly from multiple plants, and most harvesters would

not take a plant for medicine if it were the only one they encountered. Usually these protocols for restricted, sustainable harvesting are taught at an early age; for example, a young man of the Gitga'at community of Hartley Bay was instructed never to take more than four branches of devil's-club (*Oplopanax horridus*) when harvesting medicine for his elders, so that the plant would have a chance to regenerate<sup>38</sup>. One healer routinely plants a length or two of devil's-club stem in the mud to re-root whenever he harvests this plant, as a way of ensuring that it will continue to grow. After many examples of drastic decreases in medicinal plants due to overharvesting, western herbalists and plant gatherers are also increasingly careful in har-



Fig. 5. A culturally modified red alder tree (*Alnus rubra* Bong.) showing scar where a rectangular piece of bark was removed some years ago.

vesting, and some organizations post protocols for plant harvesting and conservation<sup>39</sup>.

Of course, the knowledge and use of medicinal plant species has changed over time in both Indigenous and western contexts. Some medicine species are still commonly harvested and used today, whereas knowledge of others has diminished, and in some cases only members of the oldest generation, or those who have recently passed away, recalled their use. As noted previously, new medicines and new medicine traditions, such as Traditional Chinese Medicine and acupuncture, as well as modern surgery and other treatments, are used by most people of all cultural backgrounds today. If one form of medicine does not seem to be effective, another will be tried. Herbal medicine still holds a place in people's repertoires for health and healing.

### *Conclusions*

Medicinal plant use in northwestern North America reflects a pattern of sharing and knowledge transmission evident among humans the world over. Since ancient times, people of the region have been experimenting with, discovering and sharing their knowledge and observations, their successes and failures, around herbal medicines. More recently, when newcomers from Europe and other parts of the world arrived, they too benefited from this body of knowledge on herbal healing. In turn, they brought their own plants and associated medicinal remedies from their homelands and some of these were adopted by the indigenous peoples and continue to be used to this day. The processes of sharing, adapting and building on such knowledge not only enrich our lives and help us to maintain our health, but also increase our resilience in the face of ongoing change. For Indigenous peoples, detailed knowledge about the selection, harvesting, processing and application of medicinal plants is critically important for their health and well-being, their resilience and sense of identity. It is a major component of Traditional Ecological Knowledge systems and

is the Intellectual Property of the Indigenous and original knowledge holders. This type of knowledge has been seriously eroding over the past decades, as knowledgeable elders pass away. Its recovery and restoration is part of ongoing efforts in culture and language renewal for many communities. As always, balancing ethical considerations around proprietary knowledge, with social justice, biodiversity conservation and human rights, will need constant attention and vigilance.

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