Chapter 2
Lichens Used in Traditional Medicine

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Abstract Lichens are used in traditional medicines by cultures across the world, particularly in temperate and arctic regions. Knowledge of these medicinal uses is available to us because of the contributions of traditional knowledge holders in these cultures.

The traditional medicinal uses of 52 lichen genera are summarized in this paper. Cultures in different regions of the world tend to emphasize different lichen genera in their traditional medicines, with *Usnea* being the most widely used genus. The folk taxonomy of lichens within a given culture is not synonymous with the scientific taxonomy and reflects the cultural value of those lichens and the traditional method of their identification. Even within western science the identity and taxonomy of lichens have not remained constant throughout history.

Lichens in traditional medicine are most commonly used for treating wounds, skin disorders, respiratory and digestive issues, and obstetric and gynecological concerns. They have been used for both their secondary metabolites and their storage carbohydrates. The European uses of lichens have been exported worldwide and sometimes influence the use of lichens by other cultures. These European uses started in the fifteenth and sixteenth centuries and arose from interpretations of Ancient Greek uses, as well as the application of the doctrine of signatures.

2.1 Introduction

Lichens are important traditional medicines in many different cultures. This information has been made available to us from the contributions of hundreds of traditional knowledge holders in communities across the world. It is our responsibility to respect and value the knowledge that has been given to us. This paper is a tribute to the wealth of traditional knowledge that exists about lichens.

There have been a few previous reviews on the traditional uses of lichens for medicine. The traditional uses of lichens in Europe were reviewed by Smith (1921),

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with later contributions by Llano (1948) and Richardson (1974). Sharnoff (1997) compiled the first global review lichen uses, which was added to by Crawford (2007). Upreti and Chatterjee (2007) reviewed the medicinal uses of lichens in India and republished Sharnoff's (1997) database on medicinal uses elsewhere. Wang and Qian (2013) recently reviewed the medicinal uses of lichens in China. The current paper includes all the medicinal uses recorded by these previous authors, as well as many additional records. It is the most comprehensive review to date, but it is still far from complete.

2.2 Cultures That Use Lichens

There are records of medicinal uses of lichens in cultures in Africa, Europe, Asia, Oceania, North America, and South America. The majority of these uses are in North America, Europe, India, and China, but this is most likely because that is where the majority of the ethnographic work has been done. Interestingly, no records have been found for any traditional use of lichens in Australia.

It is difficult to determine the prevalence of lichens in traditional medicine across the world. Most ethnobotanists and ethnographers have ignored cryptogams, both historically and currently.

If the ethnographic literature on a culture does not mention lichens, it might be because that culture does not utilize lichens. However, it might also be because the ethnographer's culture does not value lichens, and the ethnographer therefore did not notice and record the value of lichens in the culture that they were documenting. In the cultures for which traditional uses of lichens have been recorded, there are usually between one and three medicinal lichens. There are more records of lichen use among cultures in temperate and arctic areas and less in the tropics. This probably represents the relative dominance of lichens in these zones.

A few ethnobotanists have recognized the cultural value of lichens, and their work has been invaluable in documenting lichens in traditional medicines. These workers include, among others, N. J. Turner (Canada), M. R. González-Tejero (Spain), L. S. Wang (China), and D. K. Upreti (India). As a result, there is an overrepresentation of these geographic areas in this current analysis.

2.3 The Lichens That Are Used in Traditional Medicine

This paper documents a total of 52 different genera of lichens that are used in traditional medicines. The most commonly used genus of lichen is *Usnea*, which is used across the world for medicine, although it is often used synonymously with other arboreal hair lichens. Despite its worldwide importance, *Usnea* is not traditionally one of the dominant medicinal lichens in Europe. Numerous other genera of lichens have particular importance in certain parts of the world, as is shown in Table 2.1.

Table 2.1 Lichen genera commonly used in traditional medicine

Lichen genus	Main area of use
Usnea	Worldwide (except Australia)
Evernia and *Pseudevernia*	Europe and North Africa
Letharia	North America
Lethariella	China
Cetraria	Europe
Parmotrema and *Everniastrum*	India
Xanthoparmelia	North America and Africa
Cladonia and *Cladina*	N. America, Europe, and Asia
Thamnolia	Asia
Ramalina	N. America, Europe, and Asia
Lobaria and *Peltigera*	N. America, Europe, and Asia
Umbilicaria	North America and Asia

2.3.1 The Folk Taxonomy of Lichens

All cultures develop a folk taxonomy of living organisms that allows people to make sense of the world around them. Folk taxonomies are unique to a specific culture and usually reflect its particular environment and values. Some cultures have a very detailed folk taxonomy for lichens. The traditional taxonomy of the Saami recognizes lichens as being a distinct life form from mosses and divides lichens into three different generic taxa and numerous specific taxa (Nissen 1921). Other cultures placed less value on lichens, which is reflected in a much more simplistic folk taxonomy for lichens. European botanists in the fifteenth century lumped all lichens, and many other cryptogams, into a single life form category of ***moss***.

Folk taxonomies can be very accurate, but they are often different than the scientific taxonomy. This mismatch between folk and scientific taxonomies is particularly prevalent in lichens. For instance, the Saami folk genera of ***jægel*** includes *Cetraria*, *Cladina*, and *Stereocaulon*, but excludes *Parmelia*, which is placed in the folk genera ***gadna***. The scientific taxonomy would lump *Parmelia* and *Cetraria* together in Parmeliaceae and exclude *Cladina* and *Stereocaulon*. Another example is the common practice within folk taxonomies of classifying lichens according to their substrate. There is often a folk genera that includes all arboreal hair lichens (and sometimes mosses), which are then divided into different species depending on what type of tree they are growing on.

One of the biggest challenges in ethnolichenology is that a folk taxon of lichens that has cultural significance may not be synonymous with any scientific taxon. This means that if a culturally important lichen is identified according to the scientific taxonomy without understanding the folk taxonomy, it may be recorded as the wrong lichen. For example, a botanist recorded that the Saami used *Usnea plicata* for blisters, but maybe the lichen that he saw only happened to be *U. plicata*,

and the Saami actually used any species of *Alectoria*, *Bryoria*, or *Usnea* that was growing on a birch tree.

Folk taxonomies of lichens are intrinsically linked with the traditional methods of identifying lichens. It is very common to identify lichens based on where they are found. Lichens are often thought to imbibe their desirable properties from the substrate on which they are growing. For example, Nuxalk consider alectoroid lichens to be better medicine if growing on alder, the Gitga'at consider *Lobaria oregana* to be better if on fir, and the Ancient Greeks thought that *Evernia* was better if growing on cedar. The medicinal properties of a lichen species may change depending on where it is growing. However, this may also be a clever aid for identification. Many lichens have specific microhabitat preferences, and selecting lichens from only a specific substrate will result in preferentially selecting certain species.

Another interesting identification method is employed by the Quichua of Saraguro, Ecuador, who have determined that an effective medicine requires seven different colors of rock lichens. It is possible that there is a synergistic effect between the different lichen species. It is also possible that collecting seven different species makes it much more likely to collect the correct one.

2.3.2 Development of Lichen Taxa in Western Science

The meaning of the word ***lichen*** has changed over time, which can make it complicated to identify culturally important lichens in old documents. ***Lichen*** comes from the Ancient Greek **Λειχήν** (***leikhēn***), the first record of which is from Theophrastus in 300 B.E. (Richardson 1974). Theophrastus was probably referring to thalloid liverworts, but subsequent Ancient Greek authors may have used that name for a lichen (see Ancient Greek use of *Ramalina* spp.). Early European botanists lumped together a variety of cryptogams into the same taxon, usually including lichens, mosses, liverworts, fungi, seaweed, and sometimes even coral. de Tournefort (1694) was the first European author to distinguish lichens by the name ***lichen***, but he also included some thalloid liverworts in his taxon and excluded some lichens. It was Dillenius (1742) who reorganized the ***lichen*** taxon to make it synonymous with our modern concept.

The taxonomy and names of lichens have changed radically since Dillenius and are continuing to change in contemporary times. This can make it difficult to determine what lichen is being discussed in ethnographic literature. To add further complications, most authors know very little about lichens and thus frequently use names that are outdated or even just completely wrong.

The genus *Usnea* was created by Dillenius (1742). Linnaeus (1753) described five *Usnea* species, but lumped them all together in his all-encompassing genus *Lichen*. They were moved to the *Usnea* genus by Weber and Wiggers (1780). Four of the original species are often mentioned in ethnographic literature: *Usnea barbata*, *U. florida*, *U. hirta*, and *U. plicata*. The number of *Usnea* species has

now increased to around 350 species (Thell et al. 2012), so any reference to one of the original *Usnea* species in old herbals or ethnographies is suspect. Of the original five, only *Usnea hirta* occurs in North America (Esslinger 2014). References to *Usnea barbata* are particularly ambiguous, as the taxonomy of this species is still confusing and still being determined (Articus 2004).

The pendant *Bryoria* species were originally all lumped together as *Lichen jubatus* (Linnaeus 1753), which became *Alectoria jubata* (Acharius 1810). The taxonomy of *Bryoria* was not well understood until Brodo and Hawksworth (1977) created the genus *Bryoria*, so references to specific *Bryoria* species prior to that are ambiguous.

The Parmeliaceae is a large and diverse family of lichens that includes many culturally significant lichens. This family currently contains around 80 genera and over 2,000 species (Thell et al. 2012). Five culturally significant genera of Parmeliaceae were described before 1810: *Usnea*, *Parmelia*, *Cetraria*, *Alectoria*, and *Evernia*. By 1903, *Letharia* and *Pseudevernia* had been split from *Evernia*, and *Parmotrema* and *Hypogymnia* had been split from *Parmelia*, although historically not all authors have recognized these genera. The taxonomy of Parmeliaceae remained relatively constant until 1965, when the genus *Cetraria* began to be split into numerous different genera. The genus *Parmelia* was also split up starting in 1974. This splitting was mostly completed by the early 1990s, by which time there were over 80 genera in the family (Thell et al. 2004). Recent molecular work has resulted in some genera being lumped and others split, such that Thell et al. (2012) recognize 79 genera. Currently, the original genus *Parmelia* is divided into 32 genera and *Cetraria* into 22 genera.

For practical reasons, lichenologists sometimes lump the morphologically similar genera that were previously included in *Parmelia* and *Cetraria* back together into the categories of parmelioid (Hale and DePriest 1999) and cetrarioid lichens (Randlane et al. 2013). These morphological groupings are not entirely monophyletic (Thell et al. 2012), but they can still be useful. A third morphological grouping of Parmeliaceae lichens that is often used is the alectorioid lichens, which include several similar-looking genera of hair lichens that were previously lumped together in the genus *Alectoria*. The genus *Usnea* is sometimes included in this category.

One result of the profusion of genera within Parmeliaceae is that any reference to an unidentified species of *Parmelia* or *Cetraria* in an older ethnographic work is very ambiguous. The categories of parmelioid, cetrarioid, and alectorioid lichens are very useful when dealing with folk taxonomies of lichens, so they will be utilized in the current work.

2.4 The Medicinal Uses of Lichens

Lichens are used for many different medicinal purposes, but there are some general categories of use that reoccur across the world. Lichens are often used externally for dressing wounds, either as a disinfectant or to stop bleeding. Other common topical

uses are for skin infections and sores, including sores in the mouth. This importance of this use is apparent in the name ***lichen*** (from ***leikhēn***, 'what eats around itself'), which comes from the Ancient Greek practice of using a cryptogam to cure a skin disease.

Lichens are often drunk as a decoction to treat ailments relating to either the lungs or the digestive system. This is particularly common in Europe, but is also found across the world. Many other uses of lichens are related to obstetrics or treating gynecological issues. This may be related to the common use of lichens for treating sexually transmitted infections and ailments of the urinary system. Two other uses of lichens that are less common, but reoccur in several different cultures, are for treating eye afflictions and for use in smoking mixtures.

Many of the traditional medicinal uses of lichens are probably related to their secondary metabolites, many of which are known to both be physiologically active and to act as antibiotics. However, some of the traditional uses of lichens also rely on the qualities of lichen carbohydrates. In particular, the lichenins [β-(1→3)-(1→4)-linked D-glucans] are common in the Parmeliaceae and have a remarkable ability to absorb water and form a gel (Crawford 2007). Many of the traditional uses of lichens involve boiling the lichen to create a mucilage which is drunk for lung or digestive ailments or applied topically for other issues. Other lichen carbohydrates which may be important are the isolichenins and galactomannans, which are taxonomically widespread, and the pustulins that are found in Umbilicariaceae.

2.4.1 Medicinal Lichens of Europe

Lichens are used in traditional medicine across the world, and many cultures outside of Europe have traditional uses for lichens that are completely unrelated to Europe. However, European uses of lichens have been exported worldwide, and there are numerous instances where the European use for a lichen appears to be associated with its traditional use in a different culture. This dispersal of European uses of lichens is related to the general dispersal of other aspects of European culture across the world. One specific source of this bias may be that most ethnographers that recorded traditional uses of lichens are from a European background, and their personal cultural bias can affect what they have documented. Another source is that most literature on lichens is from a European background, and if it features any uses of lichens, those uses are generally European.

An understanding of the traditional use of lichens in Europe can therefore be important for understanding traditional uses elsewhere. The origins of the medicinal use of lichens in Europe dates back to the fourth and third century B.E., when medicinal lichens were recorded by the Ancient Greek scholars Hippocrates and Theophrastus (Lebail 1853). The use of lichens continued to be recorded by various scholars throughout the rest of the classical era, including Pedanius Dioscorides and Pliny the Elder (Rome, first century C.E.), Galen of Pergamon (Greece, second century C.E.), Paul of Aegina (Greece, seventh century C.E.), and Serapion the

Younger (a twelfth or thirteenth century compilation). These authors discuss at least three different cryptogams that might be lichens, but the most important for subsequent pharmacopoeias was an arboreal fruticose lichen called ***splanchnon*** ("intestine"). According to the original writings of Dioscorides, ***splanchnon*** was not only a powerful medicine, it was also sweet-smelling and used as a perfume (López Eire et al. 2006).

In the middle ages, various Persian scholars like Rhazes (tenth century) and Avicenna (eleventh century) wrote about the medicinal properties of ***splanchon***, and it was adopted into Unani medicine under the name ***ushna***. This lichen is currently interpreted as being *Usnea* spp.

At the start of the modern era (~ fifteenth century), herbalism flourished in Western Europe, with many authors adopting Greek herbal knowledge. These Europeans lumped together all fruticose arboreal lichens into one taxon, which they called ***usnea*** (borrowing from the Arabic ***ushna***), ***tree moss***, or ***oak moss*** (Dorstenius 1540; L'Obel 1576; Gerarde 1597; Ray 1686; Quincy 1724; Culpeper 1788). This taxon was considered to be synonymous with the Ancient Greek ***splanchon***, with all of its medicinal and perfume qualities. Parkinson (1640) accurately distinguished between numerous genera, but considered them all types of ***oak moss*** and attributed the same medicinal values to all of them.

It was not until the late 1700s that a distinction was made between the different genera of ***oak moss***, at which time the name *Usnea* was only applied to our modern genus. From this time onwards, most authors decided that the medicinal values of ***splanchon*** were referring to *Usnea* (Lightfoot 1777; Willemet 1787; Adams 1847; Lebail 1853), although the same medicinal properties were sometimes applied to *Evernia prunastri* (Willemet 1787; Lebail 1853).

Oak moss was used to make a popular scented hair powder called Cyprus powder in Europe in the late 1600s (Bauhin and Cherler 1650; Zwelfer 1672). By the time European botanists could distinguish different genera, Cyprus powder was found to contain a variety of lichen genera, including *Usnea*, *Pseudevernia*, and other arboreal lichens (Amoreux 1787). At this time *Evernia prunastri* was the preferred lichen to use for perfumes in France (Amoreux 1787). In more recent times, ***oak moss*** refers to only *Evernia prunastri* and ***tree moss*** to *Pseudevernia furfuracea*, and these are the two lichen species harvested for perfume (Moxham 1986).

When Europeans first adopted Ancient Greek herbal knowledge, they were confused as to the identity of ***splanchon***, but eventually decided that it was *Evernia*/*Pseudevernia* when used for perfume and *Usnea* when used for medicine. Dioscorides' description of ***splanchon*** is ambiguous and its identity cannot be determined with certainty, but Richardson (1974) suggests that it is referring to *Evernia prunastri* and *Pseudevernia furfuracea*. He may be correct, as these lichens were used medicinally in Europe and North Africa from ancient times to present. Europeans have added medicinal properties to *Usnea* that were not originally associated with ***splanchon*** by the Ancient Greeks. Perhaps these medicinal uses for *Usnea* existed in Europe independent of the Ancient Greek writings, and this

caused Europeans to wrongly associate the Ancient Greek medicinal uses of *Evernia/Pseudevernia* with *Usnea*.

Starting in the 1500s, the doctrine of signatures was an ubiquitous concept in European medicine. It was thought that plants looked like the organ or ailment that they cured and various lichens were adopted into the European pharmacopoeia as a result. The main medicinal lichens in early modern era Europe were *Cetraria islandica*, *Cladonia pyxidata*, *Peltigera canina*, *Peltigera aphthosa*, *Usnea* spp., *Lobaria pulmonaria*, *Xanthoria parietina*, and *Evernia prunastri*. For more details, refer to these lichens in the tables below. The widespread use of these lichens had been mostly abandoned by 1800, with the exception of *Cetraria islandica*, which has persisted as a medicinal lichen in parts of Europe until today.

2.5 Known Records of Lichens Used in Traditional Medicine

The following tables document all of the traditional medicinal uses of lichens for which the author has found records. Tables 2.2 and 2.3 provide a list of the different genera and an index to the table where they can be found. Tables 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.14, 2.15, 2.16, 2.17, 2.18, 2.19, 2.20, 2.21, 2.22, 2.23, 2.24, 2.25, 2.26, and 2.27 are organized taxonomically by lichen family and provide the details on each traditional use.

Table 2.2 Lichen genera used in traditional medicine

Alectoria, Alectorioid	*Lecanora*, Lecanoraceae	*Pseudevernia*, Parmeliaceae
Anaptychia, Physciaceae	*Leptogium*, Collemataceae	*Pseudocyphellaria*, Lobariaceae
Anzia, Parmeliaceae	*Letharia*, Parmeliaceae	*Punctelia*, Parmelioid
Aspicilia, Megasporaceae	*Lethariella*, Parmeliaceae	*Ramalina*, Ramalinaceae
Bryoria, Alectorioid	*Lobaria*, Lobariaceae	*Rhizoplaca*, Lecanoraceae
Cetraria, Cetrarioid	*Masonhalea*, Cetrarioid	*Roccella*, Roccellaceae
Cetrelia, Cetrarioid	*Mycoblastus*, Mycoblastaceae	*Siphula*, Icmadophilaceae
Cladina, Cladoniaceae	*Nephroma*, Nephromataceae	*Stereocaulon*, Stereocaulonaceae
Cladonia, Cladoniaceae	*Nephromopsis*, Cetrarioid	*Sticta*, Lobariaceae
Dermatocarpon, Verrucariaceae	*Niebla*, Ramalinaceae	*Sulcaria*, Alectorioid
Dictyonema, Hygrophoraceae	*Ophioparma*, Ophioparmaceae	*Teloschistes*, Teloschistaceae
Evernia, Parmeliaceae	*Parmelia*, Parmelioid	*Thamnolia*, Icmadophilaceae
Everniastrum, Parmelioid	*Parmotrema*, Parmelioid	*Umbilicaria*, Umbilicariaceae
Flavocetraria, Cetrarioid	*Peltigera*, Peltigeraceae	*Usnea*, Alectorioid
Flavoparmelia, Parmelioid	*Pertusaria*, Pertusariaceae	*Vulpicida*, Cetrarioid
Heterodermia, Physciaceae	*Physcia*, Physciaceae	*Xanthoparmelia*, Parmelioid
Hypogymnia, Parmeliaceae	*Polycauliona*, Teloschistaceae	*Xanthoria*, Teloschistaceae
Lasallia, Umbilicariaceae		

Table 2.3 Index to tables of lichen families used in traditional medicine

Table 2.4 Cladoniaceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Cladina spp. Nyl.	
Den'ina (Alaska, USA) ***k'udyi***	Decoction used for diarrhea (Kari 1987)
Upper Tanana (AK, USA)	A "liquor" prepared from plant was drunk for colds (McKennan 1959)
Aleut (Alaska, USA) ***kinadam aiyukax***	Drunk as a tea for chest pains. Hunters who are climbing hills chew the lichen to maintain their wind (Bank 1953; Smith 1973)
Nganasans (Siberia)	Remedy for scurvy
Saami (Scandinavia) ***ullo-jægel*** ("wool lichen")	Decoction for unspecified medicine (Nissen 1921; Eidlitz 1969)
Cladina arbuscula (Wallr.) Burgaz	
China	Used for dizziness, hypertension, pulmonary tuberculosis, fever, trauma with pus formation, and skin infections due to external injury (Wang and Qian 2013)
Cladina rangiferina (L.) Nyl.	
Ojibwe (MN and WI, USA) ***asa' gûniñk'***	Boil and use water to wash a newborn baby (Smith 1932)
Whapmagoostui Cree (Quebec, Canada) ***whapskumuk***, ***epshatuk***	Used to treat inflammation associated with diabetes (Fraser 2006)
Finland	Remedy for coughs and tuberculosis. Boil in water and drink (Richardson 1974)
China	Used for fever, headaches, cuts, coughing up blood, jaundice, blurred vision, cloudy cornea, difficulty urinating, urinary tract infection, irritable depression, rheumatism, and phlegm due to dry throat. Drink decoction; or apply decoction or powdered lichen to affected area (Wang and Qian 2013)

(continued)

Table 2.4 (continued)

Culture and ***folk name***	Traditional use
Monpa (Arunachal Pradesh, India)	Remedy for kidney stones. Half teaspoon of sun-dried, ground lichen added to one cup boiling water. Drunk in morning on empty stomach for 1 month or until cured (Rout et al. 2005)
Cladina stellaris (Opiz) Brodo [*Cladina alpestris*]	
Nihithawak (SK, Canada) ***wāpiskastastkamihk*** or ***atikōmīciwin***	Drink to expel intestinal worms: either decoction or powdered lichen added to water (Leighton 1985)
Inuit (Nunavut, Canada) ***nirait***	Broth used for sickness and eye infections (Black et al. 2008)
Primorsky and Sakhalin (Russian Far East)	Powdered form used to treat wounds and some infections (Moskalenko 1986)
China 太白花 (***tai-bai-hua***)	Used for hypertension, headaches, nosebleeds, eye diseases, tuberculosis, menstrual disorders, and vaginal discharge. Drink decoction (Hu et al. 1980; Wang and Qian 2013)
Cladonia subtenuis (Abbayes) Mattick	
Cherokee (NC, USA)	Used to relieve the pain of insect stings. Lichen chewed and put on sting, sometimes mixed with tobacco (Garrett 2003)
Cladonia amaurocraea (Flörke) Schaer.	
China	Used for headaches and dizziness (Wang and Qian 2013)
Cladonia bellidiflora (Ach.) Schaerer	
Tlingit (Alaska, USA)	Treatment for eye disease when mixed with mother's milk (Garibaldi 1999)
Haida (BC, Canada)	Red ends dipped in mother's milk and applied to sore eyes (Turner 2004a)
Cladonia cervicornis (Ach.) Flot.	
China	Used for scalds, cuts, and coughing up blood. Drink decoction; or apply decoction or powdered lichen to affected area (Wang and Qian 2013)
Cladonia chlorophaea (Flörke ex Sommerf.) Sprengel	
Okanagan (BC, Canada) ***penpenemekxísxn̓***	Decoction used to wash sores which were slow to heal. Folk name means "liver on rock" (Turner et al. 1980)
Britain ***chalice-moss***; ***cup-moss***; or ***Our Lady's chalice***; ***cwpanau pas*** (Welsh)	Used like *C. pyxidata* for whooping cough, use has continued to contemporary times in Welsh counties of Merionethshire and Denbighshire. In Waterford (Ireland), used for same purpose boiled in new milk (Allen and Hatfield 2004)
Cladonia coccifera (L.) Willd.	
Europe (early modern era) ***cup moss***	Decoction used for fever and whooping cough in children, like *C. pyxidata* (Willemet 1787; Luyken 1809; Lindley 1838)

(continued)

Table 2.4 (continued)

Culture and ***folk name***	Traditional use
Cladonia cornuta (L.) Hoffm.	
Europe (early modern era) ***horn moss***	Used with *C. pyxidata* against persistent coughs in children (Watson 1756)
Cladonia fenestralis Nuno	
Tibetans (Sichuan, China)	Medicinal tea (Wang and Qian 2013)
Cladonia fruticulosa Kremp.	
China	Extract used for bacterial infections on skin (Wang and Qian 2013)
Cladonia gracilis (L.) Willd.	
China 太白鹿角 (***tai-bai-lu-jiao***)	Used for dizziness, difficult or painful urination, nose bleeding, impetigo, and pink eye. Drink decoction; or apply decoction or powdered lichen to affected area (Hu et al. 1980; Wang and Qian 2013)
Cladonia macroceras (Delise) Ahti	
China	Drunk as decoction to relieve blockage of urination, bring down swelling, and remove toxic substances (Wang and Qian 2013)
Cladonia miniata G. Meyer [*Cladonia sanguinea*]	
Brazil	Rubbed down with sugar and water, used as remedy for mouth ulcers (Lindley 1838)
Cladonia pleurota (Flörke) Schaer.	
China	To clear ***heat***, cool liver, dissolve ***phlegm***, and eliminate ***dampness*** (Wang and Qian 2013)
Cladonia pyxidata (L.) Hoffm.	
Europe (early modern era) ***cup moss***	Widely used for whooping cough in children (Quincy 1724; Gedner 1756; Lightfoot 1777; Willemet 1787). Also for fevers and kidney stones (Luyken 1809; Lindley 1838; Lebail 1853). In Finland taken with milk for pulmonary tuberculosis (Vartia 1973)
Cladonia scabriuscula (Delise) Nyl.	
Keyagana (Papua New Guinea) ***lanefa-kikinofa***	Heated and taken orally for vaginal discharge/bleeding (Jorim et al. 2012)

Table 2.5 Lecanoraceae used in traditional medicines around the world

Culture	Traditional use
Lecanora muralis (Schreb.) Rabenh. [*Parmelia saxicola*]	
Nishinam (CA, USA)	Made into a tea and used to treat colic (Powers 1877)
Rhizoplaca chrysoleuca (Sm.) Zopf.	
China	Used for tuberculosis, intestinal obstruction, trauma with pus formation, burns and scalds, skin infections, cancer, and pain relief. Used externally or orally (Wang and Qian 2013)

Table 2.6 Mycoblastaceae used in traditional medicines around the world

Culture	Traditional use
Mycoblastus alpinus (Fr.) Kernst.	
China	Used for stopping bleeding from external injury, draining pus, burns, and nocturnal seminal emission. Drink decoction or apply powder to affected area (Wang and Qian 2013)

Table 2.7 Alectorioid lichens (Parmeliaceae) used in traditional medicines

Culture and ***folk name***	Traditional use
Alectoria Ach. spp.	
Scandinavia	Decoction for bathing chapped skin on babies or the feet of adults. Same use for *Lobaria pulmonaria*, *Usnea* sp, and *Peltigera aphthosa* (Richardson 1974)
Alectoria ochroleuca (Hoffm.) A. Massal.	
Chugach (Alaska, USA)	Possibly same as Chugach use of *Bryoria trichodes* (Wennekens 1985)
Alectoria sarmentosa Ach.	
Haida (BC, Canada) ***k'aalts'idaa liisga*** or ***k'aalts'adaa liijaa*** ("crow's mountain goat wool")	Used to strain impurities out of hot pitch when making medicine, and for other unspecified medicines. Also used *Usnea longissima* (Turner 1998, 2004a)
Nuxalk (BC, Canada) ***suts'wakt*** or ***ipts-aak*** ("limb moss")	Warmed and applied to a broken boil or festering sore (if growing on red alder). Possibly *Usnea* spp. (Smith 1929; Turner 1973)
Ditidaht (BC, Canada) ***p'u7up***	Used for wound dressing, baby diapers, and sanitary napkins. Also used *Usnea* spp. (Turner et al. 1983)
Flathead (Montana, USA) ***sqalīō***	Mother drinks tea of ***sqalīō*** and *Matricaria discoidea* to make her deliver her placenta (Stubbs 1966). Possibly *Usnea* spp.
Umatilla, Cayuse (OR, USA) ***laxpt*** or ***mak'hl***	Boiled and applied as compress for open sores, arthritis, and ***achash-pama*** [an eye problem] (Hunn 2005). Possibly *Usnea* spp.
Pallars (Spain) ***cabellera de pi***	Drunk as tea for asthma and catarrh (Agelet and Vallès 2003)
Bryoria spp. Brodo & D. Hawksw.	
Atsugewi (California, USA)	Applied as poultice to reduce swellings. Either boiled or used dry (Garth 1953)
Tsilhqot'in (BC, Canada) ***texa***; ***taxa***	Burn ***texa*** with own hair and rub ashes on hair and scalp to stop hair from going gray (Kay 1995; Turner 2004b)
France (eighteenth century)	Used for healing skin abrasions, diarrhea, and vaginal discharge (Gedner 1756; Willemet 1787)

(continued)

Table 2.7 (continued)

Culture and ***folk name***	Traditional use
Bryoria asiatica (Du Rietz) Brodo & D. Hawksw.	
China	Used for kidney deficiency and general weakness, dizziness, heart palpitation, involuntary ejaculation, night sweats, difficulty urinating, edema, impetigo, draining pus, and improving eyesight. Drink decoction; or apply decoction or powdered lichen to affected area (Wang and Qian 2013)
Bryoria bicolor (Ehrh.) Brodo & D. Hawksw.	
China	Same as Chinese use of *B. asiatica* (Wang and Qian 2013)
Bryoria fremontii (Tuck.) Brodo & D. Hawksw.	
Sahaptin (OR and WA, USA) ***kunč***	Boiled and used as poultice for arthritis (Hunn 1990)
Nimi'ipuu (Montana, USA) ***ho.póp***	Good for upset stomach, indigestion, and diarrhea (Hart 1976; Marshall 1977)
Flathead (Montana, USA) ***caúmtemkan***, ***st'telu***, ***skolápkan***, ***skolké in***, ***sqatlo***, or ***šáwtəmqən***	Important food when baked with root vegetables; when baked alone it is more a tonic for the sick than a food. (Turney-High 1937; Stubbs 1966; Hart 1974)
Okanagan (BC, Canada) ***skwelíp***	Mixed with berry juices and melted into syrup: given to newly weaned babies for their health (Gabriel and White 1954). Dried, powdered, and mixed with grease: Rubbed on navel of newborn babies to protect against infection (Turner et al. 1980)
Nlaka'pamux (BC, Canada) ***wí7e***	Warts removed by cutting them off and covering the fresh wound with ***wí7e*** that had been heated on the fire (Teit and Boas 1900; Turner et al. 1990)
Bryoria trichodes (Michaux) Brodo & D. Hawksw. [*Alectoria americana*]	
Sugpiaq (Alaska, USA) ***nakuraartum nuyii*** or ***napam ungagua'i***	Piled on sick person in the steam bath to hold the heat on his body, also used to staunch blood from wounds. Might also use *Alectoria ochrolechia* (Wennekens 1985)
Sulcaria sulcata (Lév.) Bystrek	
China	Used for dizziness, kidney deficiency, general weakness, heart palpitation, involuntary excessive ejaculation, night sweating, edema, impetigo, and sores. Drink decoction or apply to affected area (Wang and Qian 2013)
Sulcaria virens (Tayl.) Bystr.	
China	Used for aching back and legs, traumatic bleeding, menstrual irregularities, uterus prolapse, vaginal discharge, epilepsy, paralysis, impotence, and dizziness. Drink decoction or apply to affected area (Wang and Qian 2013)

(continued)

Table 2.7 (continued)

Culture and ***folk name***	Traditional use
Usnea spp. Dill. ex Adans.	
Maasai (Kenya) ***intanasoito***	Used for stomachache, malaria, backache, fever, loss of appetite, and typhoid. Crush, boil in water, and sieve (Kiringe 2008)
Mt. Kilimanjaro (Tanzania)	Ingredient in herbal tea to relieve altitude sickness (Sharnoff 1997)
Unani medicine (India) ***ushna*** or ***shaibat-al-ajooz*** "old women's hair"	An important medicine used from ~1000 C.E. to present. Used for heart troubles, for reducing inflammation, for promoting digestion and improving appetite, as an antidote, as an astringent, and as an analgesic. Helps wounds heal and lactation in women if applied as a paste on breast. *Parmotrema* spp. is sometimes included as ***ushna***, perhaps resulting from confusion with ***shaileya*** of Ayurvedic medicine (Rauf et al. 2006; Yavuz and Çobanoğlu 2010; Rauf et al. 2011). See Unani use if *U. longissima*
Iran, Iraq ***lihayat-as-shāyib***	Taken to correct bad breath. Folk name means "old man's beard" (Hooper 1937)
Taplejung (Nepal) ***jhyau***	Fired powder of ***jhyau*** is mixed with water and taken for tonic, fever, and throat pain (Poudel 2008)
New Ireland (Papua New Guinea)	Used to induce menstruation (Lee et al. 1977)
Doi Inthanon (Chiang Mai, Thailand)	Used in a bath for women following childbirth, to aid parturition and prevent infection (Sharnoff 1997)
Maori (New Zealand) ***angiangi*** or ***kohukohu***	Steeped in water and placed on affected parts for venereal disease (Best 1905). Dried, powdered, and rubbed on skin for various skin afflictions (Kerry-Nicholls 1886; Goldie 1904). Crushed with hand and lightly bandaged onto wound to stop bleeding (Brooker and Cooper 1962; Macdonald 1974). Along with moss, used as sanitary napkin, as diaper, and to keep newborn babies warm (Goldie 1904)
Europe (early modern era) ***oak moss***, ***tree moss***, ***usnea***	The Ancient Greeks had important medicinal uses for a fruticose arboreal lichen called ***splanchon***, which was likely *Evernia prunastri* or *Pseudevernia furfuracea* (see Ancient Greek use of *E. prunastri*). This lichen entered European pharmacopoeias in the early 1500s and included all fruticose arboreal lichens. By the late 1700s it was only *Usnea* spp. Europeans added to the Ancient Greek uses of ***splanchon*** and used a decoction of *Usnea* spp. for a styptic, for drying skin lesions, as an antiinflammatory, as a skin moisturizer, and for nausea, diarrhea, whooping cough, smallpox, insomnia, umbilical hernias, and uterine medicine (Lebail 1853). It was also used for diseases of the scalp and to cure dandruff (Allen and Hatfield 2004) and as ***usnea cranii humani*** (see *Parmelia saxatilis*)

(continued)

Table 2.7 (continued)

Culture and ***folk name***	Traditional use
Kartitsch (Austria)	Gathered as a medicinal plant (Christanell et al. 2010)
Aragon (Spain)	Used for respiratory ailments (González-Tejero et al. 1995)
Valsugana Valley (Italy)	Shepherds put it in their shoes to prevent or treat blisters (Sharnoff 1997)
Scandinavia	Decoction for bathing chapped skin on babies and the feet of adults. *Alectoria* sp., *Lobaria pulmonaria*, and *Peltigera aphthosa* also used (Richardson 1974)
Saami (Scandinavia) ***lappo***	Powdered and sprinkled on external wounds, and on sores from long journeys. Also used for curing ringworm and scabies (Lebail 1853; Nissen 1921)
Finland	Put on fresh or infected wound, athlete's foot, and other skin eruptions. Taken orally for sore throat and toothache. *Alectoria* spp. also used (Vartia 1973)
Dalarna (Sweden)	Used to treat foot blisters (Ahmadjian and Nilsson 1963)
Nuxalk (BC, Canada)	Probably same as Nuxalk use of *Alectoria sarmentosa* (Turner 1973)
Ditidaht (BC, Canada)	Same as Ditidaht use of *Alectoria sarmentosa* (Turner et al. 1983)
Makah (WA, USA)	Used for boils (Gill 1983)
Nihitahawak (SK, Canada) ***mithāpākwan***	Fresh lichen inserted into the nostril to stop a nose bleed (Leighton 1985)
Wabasca (AB, Canada) ***miyapakwan***	Decoction used to wash sore or infected eyes. Possibly *U. hirta* (Siegfried 1994; Marles et al. 2000)
Flathead (Montana, USA)	Probably same as Flathead use of *Alectoria sarmentosa* (Stubbs 1966)
Umatilla, Cayuse (OR, USA)	Probably same as Umatilla and Cayuse use of *Alectoria sarmentosa* (Hunn 2005)
Navaho (Utah, USA) ***cin bidaɣai***	An infusion or poultice is used to treat frozen body parts. Folk name means "wood mustache" (Wyman and Harris 1951)
Quichua (Loja, Ecuador) ***musgo de arbol***	Used for inflated, sore stomach in children. Boiled in water with honey and drunk. Must not be collected from eucalyptus or pine (Abel 2009, pers. comm.)
Usnea sect. *Neuropogon* spp. (Nees & Flot.) Mont. [syn. *Neuropogon* spp.]	
Mapuche-Tehuelche (Argentina/Chile) ***barba de piedra***; ***flor de piedra***	Used for coughs. Medicine for unspecified gastrointestinal, respiratory, cardiovascular, obstetric-gynecological, and genitourinary afflictions, as well as cultural syndromes (Estomba et al. 2006; Molares and Ladio 2014)
Usnea aciculifera Vain.	
China	Used for bladder infection, painful urination, urinary retention, swelling, and edema in heart and kidneys (Wang and Qian 2013)

(continued)

Table 2.7 (continued)

Culture and ***folk name***	Traditional use
Usnea articulata L. Hoffm. [syn. *Usnea flavescens*]	
Iraqw (Tanzania) ***hewas***	Treatment for stomachache. A handful of ***hewas*** is chewed fresh and the juice swallowed, it is bitter but relieves the pain after a while. *U. gigas* is also used (Kokwaro 1976)
Usnea articulata (L.) Hoffm.	
Samoa	Used for wounds and shin bruises (Brooker et al. 1987)
Usnea atlantica Vain.	
Canary Islands ***barbas***	Used as a disinfectant, along with other *Usnea* spp. (Darias et al. 1986)
Usnea baileyi (Stirt.) Zahlbr.	
Ayurvedic medicine (India)	Occasional adulterant in ***chharila*** (see *Parmotrema nilgherrense*). Mixed with other aromatic herbs, such as *Valeriana jatamansi* for favoring and curing tobacco, along with *U. longissima*, *U. subsordida*, *Everniastrum nepalense*, *E. cirrhatum*, and *Ramalina inflata* (Shah 1998)
Usnea barbata (L.) Weber ex F.H. Wigg.	
Xhosa (South Africa)	Used to treat mammary infections in cattle, udder is washed several times with decoction of lichen. Used for indigestion in humans, tincture or decoction taken orally several times daily (Afolayan et al. 2002)
Nepal	Endangered medicinal lichen banned from raw export (Bhattarai 1999)
Ati (Philippines) ***tagahumok puti***	Used for wounds, chopped and mixed with coconut oil, spread over wound. Used for abdominal pain, drink decoction (Madulid et al. 1989)
West Malaysia	Used for colds and strengthening after confinement (Foxworthy 1922)
Europe (early modern era)	Probably synonymous with *Usnea* spp. in early modern era pharmacopoeias, which adopted the Ancient Greek uses for insomnia, nausea, and the uterus (see European use of *Usnea* spp.). Used for internal and external bleeding, whooping cough, jaundice, and growing hair (Lightfoot 1777; Willemet 1787; Luyken 1809)
Abejar (Spain)	Used as drying agent and antiseptic for cracks and irritations of the feet (Bustinza and Caballero 1947)
Mbya-Guarani (Brazil) ***memby rakú í ja*** ("master of the energy of creatures")	Liquid made from it is given to women to cure sterility (Cadogan 1949)
Usnea campestris R. Sant.	
Mendocina (Argentina) ***barba de piedra***	Unspecified medicine (Ruiz Leal 1972; Garcia et al. 1990)

(continued)

Table 2.7 (continued)

Culture and ***folk name***	Traditional use
Usnea ceratina Ach.	
China	Used for coughs, inflamed lungs, pulmonary tuberculosis, hepatitis, headache due to *heat*, infection due to injury, inflamed lymph channels, mastitis, and snakebites (Wang and Qian 2013)
Usnea densirostra Taylor	
Argentina ***yerba de la piedra***; ***barba de piedra***	Tea applied externally as astringent, antiseptic, and antiinflammatory. Also use *U. durietzii* (Bandoni et al. 1972; Garcia et al. 1990; Vitto et al. 1997; Correche et al. 2008)
Uruguay ***yerba de la piedra***	Unspecified medicine (Osorio 1982)
Usnea diffracta Vain.	
China 老君鬚 (***lao-jun-xu***), ***Lao Tzu's beard***, ***pine gauze***, or ***female gauze***	In herbals from 500 C.E., picked in 5th lunar month and dried in shade. Used for cough, tuberculosis of neck or lungs, headache, dizziness, sweating, dim vision, swelling, pus oozing from breasts or sores, burns and scalds, snakebite, traumatic injuries, bone fracture, bleeding from external injuries, vomiting blood, blood in feces, bleeding from uterus, menstrual disorders, vaginal discharge, swelling of female genitalia, urinary tract afflictions, and ascarid or schistosoma parasitic infections. Drink decoction; or apply decoction or powdered lichen to affected area (Hu et al. 1980; Sharnoff 1997; Wang and Qian 2013)
Tibet ***gser.skud*** ("gold thread")	Cures fevers of the lungs, liver, and channels and fever caused by poisoning (Clark 1995)
Korea 송낙 (***song-nag***)	Used to induce menstruation (Pusan) and treat tuberculosis of the neck (Gongju) (Lee 1966; Lee et al. 1977)
Usnea durietzii Mot. [syn. *Neuropogon durietzii*]	
San Luis (Argentina)	Same as Argentine use of *U. densirostra* (Vitto et al. 1997)
Usnea filipendula Stirt. [syn. *Usnea dasypoga*]	
Java	Unspecified medicinal use (Uphof 1959)
Primorsky and Sakhalin (Russian Far East)	Powdered form used to treat wounds and some infections (Moskalenko 1986)
Usnea florida (L.) F. H. Wigg.	
China	Used for aching in sinews and bones, stopping bleeding or infection from external injuries, skin diseases, painful urination, coughs, tuberculosis of lungs or neck, heart palpitations, and edema. Drink decoction; or apply decoction or powdered lichen to affected area (Wang and Qian 2013)
Europe (early modern)	Decoction used for colds and coughs (Willemet 1787)
Mapuche (Chile)	Infusion used for diarrhea (Houghton and Manby 1985)

(continued)

Table 2.7 (continued)

Culture and ***folk name***	Traditional use
Usnea gigas Motyka [syn. *Usnea africana*]	
Iraqw (Tanzania)	Same as Iraqw use of *U articulata* (Kokwaro 1976)
Usnea himalayana C. Bab.	
Japan ***nayonayo saruogase***	Burned as a "lichen cigarette" (Ohmura 2003)
Usnea hirta (L.) F. H. Wigg.	
Europe (early modern)	Used for heal wounds and to prevent hair loss (Willemet 1787)
Usnea laevis (Eschw.) Nyl.	
Venezuelan Andes ***barba de piedra*** or ***tusinya***	Used for infections, dermatosis, fungal infections, tuberculosis, and pneumonia (Marcano 1991; Marcano et al. 1999)
Usnea longissima Ach.	
Unani (India) ***ushna***	Used as a simple drug to stimulate menstruation or induce abortion, taken orally and inserted into the vagina (Razzack and Fazal 1993). See Unani use of *Usnea* spp.
Northern Anatolia (Turkey)	For treating cancer, tuberculosis, and ulcers (Yazici and Aslan 2003; Odabasoglu et al. 2006)
China 松蘿 (***song-luo***), ***sun-lo***	Same use in China as *U. diffracta* (Wang and Qian 2013). Also used as a decongestant and for local treatment of ulcers and tuberculosis (Vartia 1973; Richardson 1974; Hu et al. 1980)
Mongolia	Used medicinally (Laxinamu et al. 2013)
Baiga (Madhya Pradesh, India)	Used to treat bone fractures, along with other ingredients (Lal and Upreti 1995)
Indo-Tibetan Himalayas ***urmil***	Used to heal bone fractures. Washed, air-dried, soaked overnight in salted water, and placed over affected part (Sharma 1997)
Ayurvedic medicine (India)	Same as Ayurvedic use of *U. baileyi* (mixed in tobacco) and an occasional adulterant in ***chharila*** (see *Parmotrema nilgherrense*) (Shah 1998)
Haida (BC, Canada)	Same as Haida use of *Alectoria sarmentosa* (Turner 1998, 2004a)
Ditidaht (BC, Canada) ***p'u7up*** or ***Indian bandage***	All *Usnea* spp. and *Alectoria sarmentosa* used for wound dressing, but *U. longissima* is preferred. Wrapped around wound and left a while (Turner et al. 1983)
Usnea nidifica Tayl.	
China	Unspecified medicine (Wang and Qian 2013)
Raratongan (Cook Is.) ***'uru nū*** (Mangiai), ***remu nū*** (Mauke)	Online reference to medicinal usage on Mangiai: thallus chewed and applied to cuts (to stop bleeding) and stings (McCormack 2007). Whistler (1990) records ***remu*** as a general term for lichens, mosses, and seaweeds, but records no use

(continued)

Table 2.7 (continued)

Culture and ***folk name***	Traditional use
Usnea pectinata Tayl.	
China	Used for stopping bleeding from external injuries, relieving pain, bloody feces, and swelling (Wang and Qian 2013)
Usnea plicata (L.) Weber	
Tripolitania (Libya) ***scíba***	Ingredient in medicinal decoction called ***scíba***, along with *Pseudevernia furfuracea*, *Ramalina calicaris*, and *R. farinacea* (Natale and Pollio 2012)
Saami (Scandinavia)	Put on sores on feet after walking long distances (Linnaeus 1737)
Europe (early modern)	An astringent for internal and external use (Lightfoot 1777), for whooping cough (Lindley 1838), jaundice, strengthening stomach and abdominal cavity, and restraining abortion (Luyken 1809). Also recommend *U. barbata*. See European use of *Usnea* spp.
Usnea sikkimensis Biswas sp. nov.	
Sikkim and Darjeeling (India) ***darimataghosa*** (Bengali)	Used for lung troubles, hemorrhages, and asthma; powdered and used to strengthen hair (Biswas 1956) (may be a European use)
Lepchas (Dzongu, Sikkim, India)	Used to bandage surface wounds, skin eruptions, and boils; inserted into nostril to stop nose bleeds; put in shoes to prevent or treat blisters (Pradhan and Badola 2008)
Usnea strigosa (Ach.) Eaton	
Kimi (Amusa, Papua New Guinea) ***oleazu***	Concoction taken orally for headaches (Jorim et al. 2012)
Usnea subfloridana Stirt.	
Leitrim (Ireland)	Treatment for sore eyes. Mixed with tobacco and butter, boiled, cooled, and applied as lotion to eyes (Allen and Hatfield 2004)
China	Used for painful and reddened eyes, bleeding from external injuries, and swelling (Wang and Qian 2013)
Usnea subsordida Stirt.	
Ayurvedic medicine (India)	Same as Ayurvedic use of *U. baileyi* (mixed in tobacco) and an occasional adulterant in ***chharila*** (see *Parmotrema nilgherrense*) (Shah 1998)
Usnea trichodeoides Vain.	
China	Used for coughs; pulmonary tuberculosis; headaches; blurred vision; inflamed cornea; swellings, sores, and pus discharge; bleeding from external injuries; bloody feces; uterine bleeding; menstrual disorders; and vaginal discharge. Drink decoction; or apply decoction or powdered lichen to affected area (Wang and Qian 2013)

Table 2.8 Cetrarioid lichens (Parmeliaceae) used in traditional medicines

Culture and ***folk name***	Traditional use
Cetraria islandica (L.) Ach.	
Europe (1600s to present)	Medicinal lichen in European pharmacopoeias from the 1600s to present. Common throughout Europe and Greenland, mostly for pulmonary and digestive uses. Used for salves and as a mild mucilaginous tonic. Used for pulmonary tuberculosis, coughing blood, asthma, chronic congestion, a laxative, indigestion, and dysentery. Has also been recommended for uterine cysts, kidney stones, edema, wounds, and scurvy (Ray 1686; Linnaeus 1737; Scopoli 1760; Cramer 1780; Willemet 1787; Withering 1801; Lindley 1838; Anonymous 1845; Rink and Lindorff 1856; Fink 1906; Kartnig 1980)
Estonia	Tea taken as anticancer remedy (Sak et al. 2014)
Venezia Giulia (Italy)	Used for congestion and for recovery after tuberculosis (Lokar and Poldini 1988)
Ubaye Valley (France)	Decoction used for lung ailments and as an emollient (Novaretti and Lemordant 1990)
Pallars (Spain) ***liquen de bosc***	Drunk as tea for congestion, tuberculosis, asthma, inflammation, and high blood pressure (Muntané 1991; González-Tejero et al. 1995; Agelet and Vallès 2003)
Sweden ***islandslav***	Used for whooping cough, colds, congestion, asthma, other chest ailments, appetite stimulation, diabetes, nephritis, and tuberculosis. Either decoction or infusion made from dried shredded lichen in either water or milk and drunk either warm or cold. Honey or chocolate sometimes added (Ahmadjian and Nilsson 1963)
Ket (Siberia)	Decoction for coughs (Eidlitz 1969)
China	Decoction drunk to strengthen stomach and improve digestion (Wang and Qian 2013)
Dehcho (NWT, Canada)	Decoction used to treat tuberculosis. Boiled in water 0.5–1 h, until liquid is red, and one third cup is taken 3 times daily (Lamont 1977)
Cetrelia pseudolivetorum (Asahina) W.L. Culb. & C.F. Culb.	
China	Same as Chinese use of *Anzia opuntiella* (Wang and Qian 2013)
Flavocetraria cucullata (Bellardi) Kärnefelt & A. Thell	
Pallars (Spain)	Drunk as tea to treat symptoms of asthma (Agelet and Vallès 2003)
Flavocetraria nivalis (L.) Kärnefelt & Thell	
Europe	Although not as commonly used in Europe as *Cetraria islandica*, some practitioners thought it had similar properties (Tychsen 1799; Lindley 1838)
Kallawaya (Qollahuayas, Bolivia)	Prepared in tea for treatment of motion sickness and heart attacks (Bastien 1983)
Masonhalea richardsonii (Hook.) Kärnefelt [syn. *Cornicularia richardsonii*]	
Tlingit (Alaska, BC)	Used as a treatment for inflammation of the lungs (Garibaldi 1999)
Nephromopsis pallescens (Schaer.) Park	
China	Eaten, and has an unspecified medicinal use (Wang and Qian 2013)
Vulpicida canadensis (Räsänen) J.E. Mattsson & M. J. Lai	
Ulkatcho (BC, Canada) ***dahgha*** ["limb hair"]	Medicine for coughs and colds, drink tea made from a couple handfuls of ***dagha*** in 1 L water. Also chewed fresh to help the lungs (Hebda et al. 1996)

(continued)

Table 2.8 (continued)

Culture and ***folk name***	Traditional use
Vulpicida juniperinus (L.) J.E. Mattsson & M.J. Lai	
Scandinavia	Possibly used to poison wolves along with *Letharia vulpina* (Uphof 1959)
Vulpicida pinastri (Scop.) J.E. Mattsson & M.J. Lai	
Scandinavia	Possibly used to poison wolves along with *Letharia vulpina* (Smith 1921)
China	Used for pulmonary tuberculosis, wounds oozing pus, skin infections, cancer, and spasms (Wang and Qian 2013)

Table 2.9 Parmelioid lichens (Parmeliaceae) used in traditional medicines

Culture and ***folk name***	Traditional use
Unidentified parmelioid lichens	
Unspecified (Cape area, South Africa) ***klipbolm***	Infusion is drunk for syphilis in men, back pain, and kidney trouble; mouthwash for oral thrush and teething children (Laidler 1928; Van Wyk et al. 2008; De Beer and Van Wyk 2011). Used for cancer, women's problems, aiding fertility, and inducing abortion (Aston Philander 2011).
KhoiSan (Cape area, South Africa) ***klipblom***, ***klipmos***, or ***klipbuchu***	Used as a female medicine for ***maak baarmoeder skoon*** ("cleaning the womb"), treating general pains (especially back and kidneys), an ointment for burns and wounds, colds, and bladder diseases (De Beer and Van Wyk 2011). Infusion used for cough, sore throat, fertility, oral thrush in infants, abdominal pain, backache, and kidney and bladder diseases (van Wyk and Gericke 2000).
Nepal ***jhau***	Extract and decoction are applied to treat moles (Gaire and Subedi 2011)
Lucca (Italy)	Decoction for coughs, cleansing liver, and antiinflammatory (Pieroni 2000)
Piaroa (Amaz., Venezuela) ***odoche jupacua*** (iguana toe)	Used to treat gonorrhea or "painful urination." Boiled into a tea and drunk 3–4 times a day for a week (Azenha et al. 1998)
Guahibo (Amaz., Venezuela)	Boiled in water and applied to insect bites or cuts and wounds (Azenha et al. 1998)
Everniastrum nepalense (Taylor) Hale ex Sipman [syn. *Parmelia nepalensis*]	
Ayurvedic medicine (India)	Same as Ayurvedic use of *Usnea baileyi* (mixed in tobacco) and an occasional adulterant in ***chharila*** (see *Parmotrema nilgherrense*) (Shah 1998)
Taplejung (Nepal) ***jhyau***	Used like *Ramalina* spp. for antiseptic, burns, and wounds. Applied as powder in tincture of iodine after applying the leaf juice of *Artemisia dubia* or *Eupatorium adenophorum* (Poudel 2008). Banned from raw export (Bhattarai 1999)

(continued)

Table 2.9 (continued)

Culture and ***folk name***	Traditional use
Kathmandu (Nepal) ***kalo jhyau***	Used for toothache, sore throat, and pain (Kumar et al. 1996)
Everniastrum cirrhatum (Fr.) Hale ex Sipman [syn. *Parmelia kamtschadalis*]	
India	Same as Ayurvedic use of *Usnea baileyi* (mixed in tobacco) and an occasional adulterant in ***chharila*** (see *Parmotrema nilgherrense*) (Shah 1998). When burnt the smoke relieves headache and the powder is a good cephalic snuff (Biswas 1947; Nadkarni and Nadkarni 1955).
Flavoparmelia caperata (L.) Hale	
Tarahumar (Mexico) ***ŕeté cajéra***	Dried, crushed, and dusted on burns (Pennington 1963)
China	Decoction drunk to clear ***heat*** (Wang and Qian 2013)
Parmelia hyporysalea (Vain.) Vain	
Ayurvedic medicine (India)	Occasional adulterant in ***chharila*** (see *Parmotrema nilgherrense*) (Chanda and Singh 1971)
Parmelia omphalodes (L.) Ach.	
Britain ***crottle***, ***crotal***, ***dark crottle***, or ***fiasgag nan creag*** (Gaelic: "rock lichen")	In Scotland, they wore socks dyed with ***crottle*** if walking long distance; or sprinkled it on their hose to stop their feet from getting inflamed (Cameron 1900; MacIntyre 1999). Used for a soup to strengthen invalids in Ireland; and for a poultice for cuts, sores, and burns in Ireland and Scotland (McGlinchey 1986; Allen and Hatfield 2004). Probably used interchangeably with *P. saxatilis*
Europe (early modern era)	Used to stop bleeding and stop hemorrhage during surgery. Put into nose to stop nosebleeds (Gedner 1756; Willemet 1787)
Parmelia saxatilis (L.) Ach.	
China 石花 (***shi-hua***)	Used for blurred vision, vomiting blood, jaundice, bleeding from uterus, chronic dermatitis, and oral ulcers in children. Drink decoction in wine or apply powder to affected area (Hu et al. 1980; Wang and Qian 2013)
Dalarna (Sweden) ***stenlav***	Used to remove warts (Ahmadjian and Nilsson 1963)
Britain ***crottle*** or ***light crottle***	Probably used interchangeably with *P. omphalodes* as ***crottle***
Foula (Shetland Is, Britain) ***old man***	Mixed with tobacco and smoked in the eighteenth century, a practice still remembered in 1966 (Hawksworth 2003)

(continued)

Table 2.9 (continued)

Culture and ***folk name***	Traditional use
Europe ***usnea cranii humani***, ***muscus cranii humani***, or ***muscus ex cranio humano*** (Latin); ***moss of a dead man's skull*** (English); ***usnée humaine*** (French); ***muschio del cranio*** (Italian)	An important medicine as early as the late 1500s (Gerarde 1597) and throughout the 1600s (Parkinson and Marshall 1640; Ray 1686), but various authors think it quackery by the 1700s (Quincy 1724; Diderot et al. 1765). In early drawings it is distinctly *Usnea*-like, but later authors recognize two distinct types: *Usnea*-like or crust-like (James 1748). In modern times, it has been identified as either *Parmelia saxatilis* (Smith 1921) or *Physcia* sp. (Llano 1948), although it is likely any lichen or moss found on a skull (Modenesi 2009). When collected off the skull of criminals (alt. someone who died a violent death), it was very valuable as a cure for epilepsy, to stop bleeding, and (if powdered and given in sweet wine) for whooping cough in children. Also mixed with ***mumia*** (the exudate from a mummy) to make ***unguentum armarium***, a salve that was applied to a weapon to heal a wound that it had caused
Parmelia sulcata Taylor	
Metís (Alberta, Canada)	Rubbed on gums of teething babies to relieve discomfort (Marles et al. 2000)
Saanich (BC, Canada) ***smexdáles***	Medicinal properties depend on type of tree it is growing on. Possible the lichen traditionally used for birth control. Not differentiated from *Lobaria pulmonaria* (Turner and Hebda 2012)
Parmotrema abessinicum (Nyl. ex Kremp.) Hale	
Bellary District (India) ***rathipuvvu*** ("rock flower")	Eaten medicinally (Llano 1948)
Parmotrema nilgherrense (Nyl.) Hale	
Ayurvedic medicine (India) ***chharila*** (Hindi), ***shaileya*** or ***shilapushpa*** ("rock flower") (Sanskrit), ***shailaja*** (Bengali), ***chadila*** (Urdu), ***pathar phool*** (Gujarati), ***dagad phool*** (Gujarati and Marathi), ***kallu hoovu*** (Kannada), ***rati puvvu*** (Telugu), ***sheeleyam*** (Malayalam), ***kapashwe*** (Tamil)	An important drug in many old Ayurvedic texts that is still used today. The first record is in the Atharvaveda (1500 B.E.). Although in some areas of India, high-quality ***chharila*** is mostly *Parmotrema nilgherrense*, the lichen mixture can also contain *Parmotrema chinense*, *P. perforatum*, *P. perlatum*, *Everniastrum cirrhatum*, and *E. nepalense*, with the occasional adulterants *Ramalina farinacea*, *R. inflata*, *Usnea baileyi*, *U. longissima*, *U. subsordida*, *Parmelia hyporysalea*, *Anaptychia* spp., and *Leptogium* spp. It is used for indigestion, loss of appetite, flatulence, diarrhea, stomach disorders, kidney stones, painful urination, hemorrhoids, involuntary semen emission, lack of menstruation, painful menstruation, enlarged spleen,

(continued)

Table 2.9 (continued)

Culture and ***folk name***	Traditional use
	bronchitis, congestion, shortness of breath, excessive salivation, fevers, headaches, sore throats, toothaches, broken bones, musculo-skeletal pain, rheumatism, reducing swelling, leprosy, scabies, soothing irritated skin, and prenatal and postnatal care. Also used as an aphrodisiac, diuretic, sedative, astringent, antiseptic, antibiotic, and a demulcent to reduce inflammation. It is powdered and applied on wounds to promote healing, smoked to relieve headaches, used as incense, used as a cephalic snuff, used in medicated oils, applied as a poultice to renal and lumbar regions to induce urination, and applied as a liniment to the head for headaches. (Dutt 1877; Chanda and Singh 1971; Kumar and Upreti 2001; Karadi 2010; Prasad 2013) An ingredient in ***spemen***, which is used for treating infertility in men (Pardanani et al. 1976)
Ayurvedic medicine (other countries) ***jhoola*** (Nepal)	Nepal: soup as an aphrodisiac, paste applied externally for kidney stones. China: soup for male infertility, paste applied externally for kidney stones. Malaysia: soup as an aphrodisiac and for seminal weakness. Afghanistan: used for chest disorders, paste applied to wounds for healing. Saudi Arabia: cephalic snuff for headaches and as a pain killer (Kumar et al. 1996; Karadi 2010)
Kathmandu (Nepal) ***kalo jhyau***	Used for toothache, sore throat, and pain (Kumar et al. 1996)
Parmotrema perforatum (Jacq.) A. Massal.	
Ayurvedic medicine (India)	Commonly used as ***chharila*** (see *P. nilgherrense*) (Nadkarni and Nadkarni 1955; Chanda and Singh 1971). Imported for medicine (Younos et al. 1987) and used for diuretic treatments (Biswas 1947)
Parmotrema perlatum (Huds.) M. Choisy	
Ayurvedic medicine (India)	Commonly used as ***chharila*** (see *P. nilgherrense*) (Nadkarni and Nadkarni 1955; Chanda and Singh 1971)
Parmotrema reticulatum (Taylor) M. Choisy	
Tepehuan and mestizos (Chihuahua, Mexico) ***ódai yoošígai*** or ***flor de piedra*** ("rock flower")	Tea drunk to relieve discomfort from kidney disorders or venereal disease. The tea is commonly prepared in late afternoon and left for one night before being drunk (Pennington 1969)

(continued)

Table 2.9 (continued)

Culture and ***folk name***	Traditional use
Parmotrema sancti-angelii (Lynge) Hale	
Gond and Oran (Uttar Pradesh, India ***jhavila***	Salve used to treat skin disease called ***sem***. Burn 30–50 g of ***jhavila*** and mix ash with mustard or linseed oil (Lal and Upreti 1995)
Parmotrema subtinctorium (Zahlbr.) Hale	
China	Used for bleeding from external injury, localized swelling and pain (Wang and Qian 2013)
Parmotrema tinctorum (Nyl.) Hale	
China	Used for blurred vision, bleeding from uterus, bleeding from external injuries, sores and swelling, chronic dermatitis, and localized swelling. Drink decoction or apply powdered lichen to affected area (Wang and Qian 2013)
Parmotrema zollingeri (Hepp) Hale	
Ati (Philippines) ***kalas***	Used as medicine for children with high fever and suffering from convulsions. Burn ***kalas*** and let the child smell the fumes (Madulid et al. 1989)
Punctelia borreri (Sm.) Krog	
China	Used for blurred vision, bleeding from uterus, bleeding from external injuries, sores and swelling, and chronic dermatitis. Drink decoction or apply powdered lichen to affected area (Wang and Qian 2013)
Xanthoparmelia spp. (Vain.) Hale	
Navajo (AZ and NM, USA) New Mexico: ***tschétláat*** ("rock covering"), ***nihalá·d*** ("earth moss"), or ***célá·d*** ("rock moss") Arizona: ***owa'si*** ("rock flower") or ***owa'huru'suki*** ("rock manure")	New Mexico: Elmore (1943) records ***tschétláat*** as remedy for impetigo. Wyman and Harris (1941) record widespread use of ***nihalá·d*** or ***célá·d*** chewed for canker, swollen gums, decayed teeth, etc. (may include *Peltigera* sp.). Arizona: Whiting (1939) records an unidentified rock lichen called ***owa'si*** or ***owa'huru'suki*** used for sore mouth, gums, and toothache. See also Hopi use of yellow rock lichen; and Tewa use of rock and ground lichen
Xanthoparmelia conspersa (Ehrh. ex Ach.) Hale	
Xhosa (South Africa) ***ubulembu belitye***	To treat syphilis eruptions: powder and apply externally to eruptions (perhaps after they are scarified); may be also used internally (sources disagree). To treat both known and suspected snakebites: drink one tablespoon of lichen in cold water; also scarify bite and sprinkle powdered lichen on it to draw out a ***humour***. See also Xhosa use of "unidentified rock lichen" (Smith 1888; Watt and Breyer-Brandwijk 1962)

(continued)

Table 2.9 (continued)

Culture and ***folk name***	Traditional use
Iroquois (Ontario, Canada)	Used for inflamed gums and raw throat caused by fever. Mix in 1 cup cold water with the bark of the tree it was collected off, *Coptis trifolia*, and *Fraxinus nigra*. Take one teaspoon, leave in mouth until water is warm, and then swallow. Repeat for entire cup (Herrick 1995)
O'odham (Arizona, USA) ***jievut hiawsik*** or ***jewed hiósig*** ("earth flower")	Traditional use described by Curtin (1949). Lipp (1995) identified the lichen as *X. conspersa*, but Hawksworth (2003) disagrees. Carried as good luck charm, but overuse will make you sick. Mixed with tobacco and smoked to "make young men crazy." Also ground into a powder and sprinkled on sores or cuts, but not bound, as it would cause blisters. Applied over several days to heal rattlesnake bite
Xanthoparmelia convoluta (Kremp.) Hale [*Xanthomaculina convoluta*]	
Khoikhoi (Namibia)	Infusion taken as remedy for rheumatism and arthritis. See also Topnaar [a Khoikhoi tribe] use of *X. hottentotta* (Watt and Breyer-Brandwijk 1962)
Xanthoparmelia hottentotta (Ach.) A. Thell et al. [syn. *Xanthomaculina hottentotta*]	
Unspecified (Namibia)	Used to treat inflammation of udder for goats and sheep. Dried, roasted, and powdered; mixed with aromatic shrubs, fungal spores, and very fine quartz dust; then added to tail-fat to make an ointment for the udder (Epstein 1937)
Topnaar (Kuiseb, Namibia) **ǀ *ui* ǁ *khaob***; or ***uijkhao.b.***	Decoction drunk to cure coughs and to relieve stomach and chest pains (van Damme et al. 1992)
Xanthoparmelia scabrosa (Taylor) Hale	
New Age herbalism	Currently sold as "traditional Chinese medicine," as an aphrodisiac, and a cure for male impotence. No record of this use was found prior to 2007 (Tshiteya 2007)
Xanthoparmelia tinctina (Maheu & Gillet) Hale	
China	Used for blurred vision, bleeding from uterus, bleeding from external injuries, sores and swelling, and chronic dermatitis. Drink decoction; or apply decoction or powdered lichen to affected area (Wang and Qian 2013)

Table 2.10 Other Parmeliaceae lichens used in traditional medicines

Culture and ***folk name***	Traditional use
Evernia divaricata (L.) Ach.	
China	Used for coughs, pneumonia, hot flashes due to pulmonary tuberculosis, hepatitis, headaches, infection due to trauma, inflammation of the breasts, and snakebites (Wang and Qian 2013)
Evernia prunastri (L.) Ach.	
Ancient Greece **σπλάγχνον** (***splanchon***, "intestines") or **βρῦον** (***bryón***, "moss")	An arboreal lichen recorded by Dioscorides in Section 1.21 of De Materia Medica (50–70 C.E.) that is best if sweeter-smelling, whiter, and growing on cedar. Probably refers to *E. prunastri* and *Pseudevernia furfuracea*, with *E. prunastri* being preferred (Richardson 1974). Used in ointments for an astringent; decoction used either hot or cold for washing the vulva for diseases of the womb; and used as a remedy against fatigue (López Eire et al. 2006)
Europe (early modern era) ***oak moss***, ***mousse chêne***, or ***eichenmoss***	Ancient Greek uses adopted in Europe starting in 1500s, but originally applied to all fruticose arboreal lichens. By late 1700s these uses often applied to *Usnea* spp., but sometimes to *Evernia prunastri*. Used for uterine and anal prolapse and for preventing abortion (Quincy 1724; Willemet 1787; Luyken 1809). Also used for intestinal weakness, fevers, and pulmonary afflictions (Lindley 1838; Uphof 1959). Mixed with *Pseudevernia furfuracea* and *Hypogymnia physodes* as ***Lichen quercinus virdes***, a popular drug in early modern Europe (Senft 1911; Llano 1948)
Evernia mesomorpha Nyl.	
Chipewyan (SK, Canada) ***k'i tsa^{n}jú*** ("birch lichen")	Treatment for snow blindness. Harvest from birch, boil, cool, and drop decoction into eyes (Marles 1984)
China	Same use in China as *E. divaricata* (Wang and Qian 2013)
Pseudevernia furfuracea (L.) Zopf [syn. *Evernia furfuracea*, *Borrera furfuracea*]	
Ancient Egypt	Found in a vase in a tomb dated to the fourteenth to sixteenth century B.E., along with other medicinal plants (Müller 1881). Used, along with other botanicals, to stuff mummies (Baumann 1960). Does not currently grow in the area, potentially imported from elsewhere
Ancient Greece	See Ancient Greek use of *Evernia prunastri*
Tripolitania (Libya) ***scíba***	Ingredient in medicinal decoction called ***scíba*** from early 1900s, along with *Usnea plicata*, *Ramalina calicaris*, and *R. farinacea* (Natale and Pollio 2012)
Europe (early modern era) ***treemoss***, ***mousse d'arbre*** (French)	A substitute for quinine (Willemet 1787). Used for fevers and as an astringent (Lindley 1838). Mixed with *Evernia prunastri* and *Hypogymnia physodes* as ***lichen quercinus virdes***, a popular drug in early modern Europe (Senft 1911; Llano 1948)
Kutahya (Turkey)	Used for wounds, eczema, and hemorrhoids. Put in healing cream with clay (Güvenç et al. 2012)

(continued)

Table 2.10 (continued)

Culture and ***folk name***	Traditional use
Pallars (Catalonia, Spain) ***liquen***	Drunk as tea for asthma, congestion, and high blood pressure (Agelet and Vallès 2003)
Alfacar, Víznar (AN, Spain) ***musgo***	Used for respiratory ailments. Washed, boiled for a considerable time, and then drunk (González-Tejero et al. 1995)
Jaén (AN, Spain) ***líquen de pino*** or ***muedos***	In Villanueva del Arzobispo it is collected and sold for very good medicines (Fernández Ocaña 2000)
Letharia vulpina (L.) Hue [syn. *Evernia vulpina*]	
Sweden ***ulf-mossa***	Used for wolf poison in Sweden. Pulverized, mixed with fat and flesh, warmed in pan over fire, and then add fresh blood and cheese to create odor. Sometimes mix with powdered glass or strychnine. Put under skin of carcass, wolf will die within 24 h of ingestion. Older, drier lichen is more potent (Withering 1801; Schade 1954)
Niitsitapii (Alberta, Canada) ***e-simatch-sis*** ("yellow dye")	Infusion of the lichen and bone marrow for stomach disorders like ulcers. Lichen was blackened in a fire and rubbed on a rash, eczema, and wart sores (McClintock 1910; Hellson and Gadd 1974)
Okanagan (BC, Canada) ***kwarē'uk*** or ***kwernúkw***	Weak decoction drunk for internal problems and strong decoction used to wash external sores and wounds (Teit and Boas 1928; Turner et al. 1980)
Umatilla and Cayuse (Oregon, USA) ***laxpt*** or ***maqa'hl***	Boiled and then applied as a poultice for open sores, boils, bruises, swellings, arthritis, and eye problems. Also used for saddle sores on horses. Liquid also drunk for hemorrhaging (Hunn 1990, 2005)
Achomawi (California, USA)	Used for poison arrows. Tips imbedded in masses of wet lichen and left for up to a year, rattlesnake venom sometimes added (Merriam 1966)
Yuki and Wailaki (CA, USA) ***ōl-gät'-i***	Medicine for inflammation and to dry up running sores (Chesnut 1902; Mead 1972)
Lethariella cashmeriana Krog	
Naxi (nw Yunnan, China) ***luxingcha*** or ***hongxuecha***	Traditional Tibetan health-promoting tea for reducing blood pressure, body fat, and inflammation. Boiling water is added to dry thalli in a cup, and the infusion is drunk after 3–5 min. Also drunk non-medicinally (Wang et al. 2001; Fu et al. 2005)
Lethariella cladonioides (Nyl.) Krog	
China and Tibet (nw Yunnan) ***gangge*** (Tibet), ***jin shua ba*** (China), ***hongxuecha***	Used for health-promoting tea to tranquilize the mind and treat a decrease in vital energy, schizophrenia, and epilepsy. Also used for reducing inflammation, relieving pain, and burns and scalds. Drunk as decoction or tea; or powder applied to affected area (Zhang and Hu 1981; Fu et al. 2005; Wang and Qian 2013; Ju et al. 2013)
Lethariella sernanderi (Mot.) Obermayer	
Naxi (nw Yunnan, China)	Same as Naxi use of *L. cashmeriana* (Wang et al. 2001; Fu et al. 2005)

(continued)

Table 2.10 (continued)

Culture and ***folk name***	Traditional use
Lethariella sinensis Wei & Jiang	
Naxi (nw Yunnan, China)	Same as Naxi use of *L. cashmeriana* (Wang et al. 2001)
Lethariella zahlbruckneri (Du Rietz) Krog	
China ***hongxuecha***	Used for aching back and weak legs, paralysis, menstrual disorders, vaginal discharge, dizziness, impotency, and epilepsy. Drink decoction or make tea or wine; or apply powder to affected area (Fu et al. 2005; Wang and Qian 2013)
Hypogymnia physodes (L.) Nyl. [syn. *Parmelia physodes*]	
Europe (early modern era)	Mixed with *Evernia prunastri* and *Pseudevernia furfuracea* as ***lichen quercinus virdes***, a popular drug in early modern Europe (Senft 1911; Llano 1948).
Neshnabé (WI, USA) ***wa'kwûnûk*** ("egg bush")	Eaten raw as a cure for constipation (Smith 1933)
Hypogymnia hypotrypa (Nyl.) Rass.	
China	Used for dim vision, bleeding from uterus, bleeding from external injury, chronic dermatitis, and sores. Drink decoction with 3–9 g lichen one time; or apply decoction or powdered lichen to affected area (Wang and Qian 2013)
Anzia opuntiella Müll. Arg.	
China	Used for blurred vision, bleeding from uterus, traumatic bleeding, sores, and chronic psoriasis. Drink decoction; or apply decoction or powdered lichen to affected area (Wang and Qian 2013)
Anzia ornata (Zahlbr.) Asahina	
China	Same as Chinese use of *A. opuntiella* (Wang and Qian 2013)

Table 2.11 Physciaceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Anaptychia spp. Körber	
Ayurvedic medicine (India)	Occasional adulterant in ***chharila*** (see *Parmotrema nilgherrense*) (Chanda and Singh 1971)
Heterodermia diademata (Taylor) D. D. Awasthi	
Nepali (Sikkim, India) ***dhungo ku seto jhua***	Used for cuts and injuries. Leaves of *Ageratina adenophora* are made into paste and put on cuts and then plastered with paste of lichen thalli to protect it from water and any other infection (Saklani and Jain 1994)
Physcia spp. (Schreber) Michaux	
Europe (early modern era) ***usnea cranii humani***	See European use of ***usnea cranii humani*** under *Parmelia saxatilis* (Llano 1948)

Table 2.12 Ramalinaceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Niebla bourgeana (Mont. ex Nyl.) Rundel & Bowler	
Almeria (Spain) ***flor de piedra*** ("stone flower")	Decoction used as diuretic to treat renal lithiasis. One cup taken daily until patient is better (González-Tejero et al. 1995; Martínez-Lirola et al. 1996)
Niebla flaccescens (Nyl.) Rundel & Bowler	
Quechua (Pampallacta: Peru) ***papel-papel***	Drink infusion for coughs. Thallus also chewed with coca leaves for magic rituals (Velasco-Negueruela et al. 1995)
Ramalina spp. Ach.	
Ancient Greece **Λειχήν** (***leikhēn***) or **βρύον** (***bryón***, "moss")	A cryptogam growing on wet rocks is recorded by Dioscorides in Section 4.53 of De Materia Medica (50–70 C.E.). Could be any saxicolous lichen or bryophyte. Early European herbals interpret it as a thalloid liverwort (e.g., L'Obel 1576). Recent interpretation is as *Ramalina* sp., as this matches with the original drawing (López Eire et al. 2006; Yavuz 2012). Applied as a poultice, it stops bleeding, relieves inflammation, and cures ***lichen*** (the skin disease). Mixed with honey it cures jaundice, and smeared on the mouth and tongue, it relieves colds and congestion. Pliny records a similar cryptogam in his Naturalis Historia (77 C.E.) that is dry, is white, and grows on rocks near streams. It is put on wounds to stop bleeding and used to cure jaundice and impetigo. It has been interpreted as a thalloid liverwort, *Peltigera canina*, or *Ochrolechia parella* (Bostock and Riley 1855; Yavuz 2013)
Taplejung (Nepal)	Same as Taplejung use of *Everniastrum nepalense* (topical antiseptic) (Poudel 2008)
Kanikkars (Tamil Nadu, India) ***kalchadai***	Used in combination with dried elephant milk, silt stone, and *Cuminum cyminum* extract to cure small pox (Nagendra Prasada et al. 1996)
Ramalina calicaris (L.) Fr.	
Tripolitania (Libya) ***scíba***	Ingredient in medicinal decoction called ***scíba***, along with *R. farinacea*, *Usnea plicata*, and *Pseudevernia furfuracea* (Natale and Pollio 2012)
Ramalina capitata (Ach.) Nyl.	
Pallars (Spain) ***liquen***	Drunk as tea to relieve symptoms of asthma (Agelet and Vallès 2003)
Ramalina conduplicans Vain.	
Yi, Dai, and Han (s. Yunnan, China) ***shouxu***, ***shikuacai***, or ***shuhua***	Cold dish served at marriage banquets, couples who eat it will love each other more and never separate. Boiled in water with soda for 10–20 min, soaked in new water for 1–2 days, and served with chili powder, salt, and other seasonings (Wang et al. 2001). Medicine to reduce inflammation (Wang and Qian 2013)
Ramalina farinacea (L.) Ach.	
Ayurvedic medicine (India)	Occasional adulterant in ***chharila*** (see *Parmotrema nilgherrense*) (Shah 1998)
Tripolitania (Libya) ***scíba***	Ingredient in medicinal decoction called ***scíba***, along with *R. calicaris*, *Usnea plicata*, and *Pseudevernia furfuracea* (Natale and Pollio 2012)

(continued)

Table 2.12 (continued)

Culture and ***folk name***	Traditional use
Nigeria	Aqueous extract for treating mental disorders. Tinctures for treatment of ringworm tinea (Esimone and Adikwu 1999)
Ramalina inflata Hooker f. & Taylor	
Ayurvedic medicine (India)	Same as Ayurvedic use of *Usnea baileyi* (mixed in tobacco) and an occasional adulterant in ***chharila*** (see *Parmotrema nilgherrense*) (Shah 1998)
Ramalina menziesii Taylor	
Pomo (California, USA)	Used as baby diapers (Goodrich et al. 1980)
Ramalina roesleri (Hochst.) Hue	
China	Used for traumatic injuries, bleeding, and swelling (Wang and Qian 2013)
Ramalina sinensis Jatta	
Yunnan (China)	Same as Chinese use of *R. conduplicans* (Wang et al. 2001)

Table 2.13 Stereocaulaceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Stereocaulon exutum Nyl.	
China	Same as Chinese use of *S. paschale* (Wang and Qian 2013)
Stereocaulon himalayense Asahina & I.M. Lamb	
Lepchas (Darjeeling, India) ***dhungo-ku-jhau***	Thalli pounded and boiled in water; take 100 ml twice daily after meals for burning sensation when urinating or other urinary trouble; decoction also used for tongue blisters (Saklani and Jain 1994)
Indo-Tibetan Himalayas ***chanchal***	Decoction used to treat urinary infections. Entire lichen boiled in water or goat's milk (Sharma 1997)
Stereocaulon paschale (L.) Hoffm.	
Mistissini Cree (Quebec) ***wapskirnok***	Used to treat rheumatism/arthritis associated with diabetes (Fraser 2006; Leduc et al. 2006)
China 石寄生 (***shi-ji-sheng***)	Used for spontaneous external bleeding, other bleeding, and dizziness. Drink decoction (Hu et al. 1980; Wang and Qian 2013)
Stereocaulon vulcani (Bory) Ach.	
Réunion ***fleur de roche*** or ***fleur galet***	Boiled to treat ulcers. Roasted and used to treat cankers. Mixed with sulfur, *Hubertia ambavilla* [endemic shrub], and coconut oil to make an ointment for wounds. Used in a drink to stop vaginal discharges. Boiled in water with handful of *Hylocereus undatus* roots [cactus], *Tribulus cistoides*, and a piece of *Argemone mexicana* root [poppy] and drunk to treat syphilis (Lavergne 1989)

Table 2.14 Collemataceae used in traditional medicines around the world

Culture	Traditional use
Leptogium spp. (Ach.) Gray	
Ayurveda (India)	Occasional adulterant in ***chharila*** (see *Parmotrema nilgherrense*) (Chanda and Singh 1971)

Table 2.15 Lobariaceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Lobaria spp. (Schreber) Hoffm. [partial syn. *Sticta* spp.]	
Bhutan	Pulverized and made into a paste to cure skin diseases (Søchting 1999)
Northwest Yunnan (Tibet) ***qingwapi***	Whole plant used to treat indigestion (Ju et al. 2013)
Gitksan (BC, Canada) ***gwilalh ganaaw*** ("frog blankets")	Used as arthritis medicine, a tonic, and a spiritual health-promoting and purification treatment. Aqueous infusion used as tea or a bath (Johnson 1997)
Haida (BC, Canada) ***kayd gyaa'ad*** ("tree blanket")	Ingredient in several different medicinal mixtures. Also called ***hlk'inxa kwii'awaay*** ("forest cloud") or ***xil kwii.awaa*** ("cloud leaves") (Turner 2004a)
Nuxalk ***sts'wakt-aak***	Used for stomach pains, but not diarrhea, constipation, or vomiting. Only collected from *Cornus stolonifera* [dogwood] or *Pyrus diversifolia* [crabapple], boiled, and five cups of hot decoction are drunk daily. Decoction also used as an eyewash. Also, plant is pulverized and applied to skin (Smith 1929; Turner 1973)
Makah (Washington, USA) ***didi'dichia*** ("growing on rocks")	When found on rocks it is used for running sores that are hard to heal, especially sores on the leg caused by bruises from walking among rocks (Densmore 1939). The identity of this lichen is uncertain: most *Lobaria* and *Sticta* species grow on trees
Lobaria isidiosa (Müll. Arg.) Vain.	
China 老龍皮 (***lao-long-pi***)	Used for indigestion, reducing inflammation, relieving pain, burns and scalds, edema due to kidney inflammation, and malnutrition in children (Hu et al. 1980; Wang and Qian 2013)
Lobaria kurokawae Yoshim.	
China	Same as Chinese use of *L. pulmonaria*, but not used for severe itching of skin (Wang and Qian 2013)

(continued)

Table 2.15 (continued)

Culture and ***folk name***	Traditional use
Lobaria orientalis (Asahina) Yoshim.	
China	Same as Chinese use of *L. pulmonaria* (Wang and Qian 2013)
Lobaria oregana (Tuck.) Müll. Arg.	
Gitga'at (BC, Canada) ***nagaganaw*** ("frog dress")	Boiled with juniper and used as medicine for sore throats. Best for medicine if collected off *Abies lasiocarpa* [fir] (Turner and Thompson 2006)
Lobaria pulmonaria (L.) Hoffm.	
Europe (early modern era) ***muscus pulmonarius*** (Latin); ***lungwort***, ***lungs of oak***, or ***oak lung*** (English); ***hazelraw*** (Scotland); ***crotal coille*** (Ireland)	Its use for lung ailments goes back at least as far as the 1500s (L'Obel 1576) and was widespread throughout Europe during the 1600s (Parkinson and Marshall 1640; Ray 1686). Its popularity then waned, only being used in certain areas like the Scottish Highlands and New Forest (England), but many authors remained convinced of its efficacy (Watson 1756; Withering 1801; Wise 1863; Cameron 1900; de Crespigny and Hutchinson 1903). It was mainly used in lung ailments (e.g., tuberculosis, asthma, coughs, spitting blood), but also for liver diseases, as an appetite stimulant, for diarrhea, for heavy menstrual flow, and to stop bleeding. It was usually boiled with water or milk and drunk or made into an ointment for external use. It was also used for lung ailments in livestock in England, Germany, and Sweden (De Grey 1639; Willemet 1787; Drummond 1861)
Molise (Italy)	Applied to cuts as an antiseptic and healing agent (Guarrera et al. 2008)
India ***golmataghosa*** (Bengal)	Used for hemorrhages, lung troubles, asthma, and strengthening hair. The hill men use it for curing eczema on the head and cleaning hair (Biswas 1956)
Afghanistan ***gul-i-sang*** ("stone flowers")	Applied to newborn child's navel to dry and heal wound. Used as contraceptive, 4 different methods: (1) consume the lichen with water during menstrual period (Kabul); (2) dry, grind, and pop the resulting power into the mouth like snuff for 3 days during menstrual period (Kunduz); (3) grind and consume 24 h after giving birth (Kabul); (4) men consume the lichen (Kabul) (Hunte et al. 1975)

(continued)

Table 2.15 (continued)

Culture and ***folk name***	Traditional use
China 哈螞七 (***ha-ma-qi***)	Used for indigestion, malnutrition in children, abdominal distension, ascarid infestation, burns and scalds, edema due to kidney inflammation, local swelling, reducing inflammation, relieving pain, and severe itching of skin. Drink decoction or apply powder to affected area (Hu et al. 1980; Wang and Qian 2013)
Nlaka'pamux (BC, Canada) ***ʔes-tə/kʷl'-ít tək p'ə·/p'éy'łe tək /qʷzém*** ("yellowish frog moss")	Previously used medicinally, details forgotten (Turner et al. 1990)
Coast Tsimshian (BC, Canada)	Used medicinally (Johnson 2006)
Hesquiat (BC, Canada) ***ƛ̓acƛ̓astuphc̓um***	Applied to the faces of children when their skin is peeling. Also used as medicine for coughing up blood (Turner and Efrat 1982)
Saanich (BC, Canada)	Same as Saanich use of *Parmelia sulcata* (possible birth control) (Turner and Hebda 2012)
Lobaria quercizans Michaux [syn. *Sticta glomulifera* in N.A.]	
Menomini (Wisconsin, USA) ***wakùn***	Eaten as a tonic and as medicine for run-down systems. Only picked off hard maple or hemlock trees and cooked in soups (Smith 1923)
Lobaria retigera (Bory) Trevis.	
China 老龍皮 (***lao-long-pi***)	Same as Chinese use of *L. pulmonaria* (Hu et al. 1980; Wang and Qian 2013)
Lobaria sublaevis (Nyl.) Yoshim.	
China	Used for indigestion, edema, inflammation, and pain relief (Wang and Qian 2013)
Lobaria yunnanensis Yoshim.	
China	Same as Chinese use of *L. pulmonaria* (Wang and Qian 2013)
Lobaria virens (With.) J.R. Laundon [syn. *Lobaria laetevirens*]	
Europe (early modern era)	Occasionally listed in old European pharmacopoeias (Gioanetto 1993)
Pseudocyphellaria aurata (Ach.) Vain.	
Ambavaniasy (Madagascar)	Used as tea to treat indigestion (Sharnoff 1997)
Sticta spp. (Schreber) Ach.	
Makah (Washington, USA)	See Makah use of *Lobaria* spp. (Densmore 1939)
Nuxalk	See Nuxalk use of *Lobaria* spp. (Smith 1929)
Sticta wrightii Tuck.	
China	Used for indigestion; and edema from kidney inflammation (Wang and Qian 2013)

Table 2.16 Nephromataceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Nephroma arcticum (L.) Torss.	
Yup'ik (Alaska) ***kusskoak***	Infusion with hot water is fed to a person in weak condition to make him strong, a very effective medicine (Oswalt 1957)

Table 2.17 Peltigeraceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Peltigera spp. Willd.	
Dena'ina (Alaska, USA) ***k'udyika'a***	Decoction drunk for tuberculosis and prolonged bleeding. *Umbilicaria* spp. are also used (Kari 1987)
Haida (BC, Canada) ***hlk'inxa kwii'awaay*** ("forest cloud") or ***xil kwii.awaa*** ("cloud leaves")	Ingredient in several different medicinal mixtures (Turner 2004a)
Oweekeno (BC, Canada) ***x̌xwp̓igà***	Thallus pounded, mixed with spruce pitch, and used to dress wounds (Compton 1993)
Ditidaht (BC, Canada) ***λ̓aλ̓x̣ʔa·ʔaq*** ("flat against the rock") or ***λ̓i·λ̓i·dqʷaqsibakk̓ʷ*** ("resembles baleen whale")	A gray *Peltigera* growing on rocks that was used to induce urination. Picked, washed, squashed, and eaten (Turner et al. 1983)
Navajo (NM, USA) ***nihalá·d*** ("earth moss")	May be chewed like *Xanthoparmelia* sp. for cankers, swollen gums, and decayed teeth (Wyman and Harris 1941)
Peltigera aphthosa (L.) Willd.	
China	Used to improve digestion (Wang and Qian 2013)
Europe (early modern era)	As early as the 1700s, it was used as medicine thrush (mouth ulcers) in children. Make an infusion in milk and drink. It induces vomiting in large doses. Also used to expel worms (Gedner 1756; Strandman 1769; Willemet 1787; Withering 1801; Luyken 1809; Lindley 1838)
Tlingit (Alaska, USA)	Dried, powdered, and used to treat burns and scalds (Emmons 1991)
Ditidaht (BC, Canada) ***t̓it̓idiččʔa·*** ("rocks growing on rocks")	Chewed and eaten for tuberculosis. Also used as poultice for sores on legs (Turner et al. 1983)

(continued)

Table 2.17 (continued)

Culture and ***folk name***	Traditional use
Nlaka'pamux (BC, Canada) ***p'ə·/p'éy'łe təkˀ /qʷzém*** ("frog moss") or ***p'ə·/p'éy'łeh=éy'st*** ("frog's rocks")	Used to rub on beestings (Turner et al. 1990)
Peltigera britannica (Gyelnik) Holt.-Hartw. & Tønsberg	
Ditidaht (BC, Canada)	Possibly same as Ditidaht use of *P. aphthosa* (Turner et al. 1983)
Peltigera canina (L.) Willd.	
Britain ***lichen cinereus terrestris*** (Latin); ***dog lichen*** or ***ash-coloured ground liverwort*** (English); ***lus ghoinnich*** or ***gearan*** (Gaelic, from Cameron 1900)	A plant called ***the star of the earth*** was used as a cure of rabies in Britain as early as the 1600s. In the oldest record, this is definitely a vascular plant (De Grey 1639), but later authors decided that it was *P. canina* (Gourdon 1687; Dampier and Sloane 1698). The remedy was popularized in 1720 by Dr. Mead and enjoyed a short period of renown (Mortimer 1735; Hartley et al. 1737), before people began to become suspicious of its efficacy (Steward 1738; Ranby and Peters 1744; Layard 1757; Lightfoot 1777). Still being used in some areas in Wales in early 1800s (Trevelyan 1909; Allen and Hatfield 2004). Dried lichen and black pepper were pulverized and mixed into warm milk. This remedy was called ***pulvis antilyssus***
India and China ***patamataghosa*** (Bengali)	Used for rabies and jaundice in India (Biswas 1956) and China (Wang and Qian 2013)
Himalayas (India)	Tonic and medicine for liver complaints (Subramanian and Ramakrishnan 1964)
Hesquiaht (BC, Canada)	Unspecified medicine (Turner and Efrat 1982)
Peltigera membranacea (Ach.) Nyl. [syn. *Peltigera canina* var. *membranacea*]	
Kwakwaka'wakw (BC, Canada) ***tl'extl'ekw'és*** ("seaweed of the ground")	Used as a love charm (Boas 1921)
Peltigera polydactylon (Neck.) Hoffm. [syn. *Peltigera polydactyla*]	
Lepchas (Sikkim, India) ***jhau***	Used as antiseptic and to stop bleeding. Thalli made into paste and put on cuts (Saklani and Jain 1994)
Indo-Tibetan Himalayas ***sharda***	Lichen is washed, pounded, and boiled in goat's milk; the resulting mash is soaked in cow's urine to be used as an antiseptic over cuts and bruises (Sharma 1997)
China	Used for traumatic injuries and to strengthen the constitution (Wang and Qian 2013)
Iroquois (Ontario, Canada)	Tea used to induce vomiting and as an anti-love medicine. Either makes loved one return or unbewitches you (Herrick 1995)

Table 2.18 Teloschistaceae used in traditional medicines around the world

Culture	Traditional use
Polycauliona candelaria (L.) Frödén, Arup, & Søchting [syn. *Xanthoria candelaria*]	
Europe (early modern era)	Boiled with milk to treat jaundice, along with *Xanthoria parietina* (Tonning 1769).
Teloschistes flavicans (Sw.) Norm.	
China	Used to clear ***heat*** in lung and liver and to remove toxins (Wang and Qian 2013)
Xanthoria parietina (L.) Th. Fr.	
Andalucia (Spain) ***flor de piedra*** ("stone flower") or ***rompepiedra*** ("stone breaker")	Decoction in wine for menstrual complaints (Campohermoso). Decoction in water for kidney disorders (Barranquete, Cueva de los Medinas, Joya, Pozo de los Frailes, and Puebloblanco). Decoction in water for toothaches (Fernan Pérez and Joya). An analgesic for several pains (Fuente del Escribano). Ingredient in a cough syrup with *Ceratonia siliqua, Ficus carica*, and *Prunus amygdalus* fruits; *Olea europaea* and *Origanum vulgare* leaves and flowers; and lots of sugar or honey (San Isidro Jiménez) (González-Tejero et al. 1995)
Europe (early modern era)	Boiled with milk to treat jaundice, along with *Polycauliona candelaria* (Tonning 1769). Used for diarrhea (Luyken 1809), for intermittent fevers (Lindley 1838), for hepatitis (Gioanetto 1993), for diarrhea and dysentery (Willemet 1787), and as a quinine replacement for malaria (Lebail 1853)
China	Used medicinally as an antibacterial (Wang and Qian 2013)

Table 2.19 Roccellaceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Roccella sp.	
Ancient Greece **φῦκος θαλάσσιον (*phŷkos thalássion*,** "marine phycos"), ***ballaris***, ***irane***, or ***gnomeusilum***	A cryptogam growing on seashore rocks is recorded by Dioscorides in Section 4.99 of De Materia Medica (50–70 C.E.). Recommended for inflammations and gout in the feet that needs to be reduced (López Eire et al. 2006). Possibly a marine algae, but identified by Richardson (1974b) as *Roccella* sp.
Sicuani (Peru)	Two *Roccella* sp. sold in indigenous market: one for coughs and one for fever (Sharnoff 1997)
Roccella babingtonii Mont.	
Seri (Sonora, Mexico) ***heecoj***	Tea: shortness of breath and fever. Ground, moistened, and strained: filtrate put on a burn or sore. Ground with clay and water: fever and diarrhea. Ground and mixed with water: bathe child with fever (Felger and Moser 1985)

(continued)

Table 2.19 (continued)

Culture and ***folk name***	Traditional use
Roccella fuciformis (L.) DC.	
Pondicherry (India) ***mathaghasa*** ("to rub on skull")	Used to clean hair and cure eczema on the skull and back or the ear (Biswas 1947)
Roccella phycopsis Ach. [*Roccella tinctoria*]	
France ***orseille***, ***orchal***	Remedy for tickling in the throat (France). Used in Mauritius for a medicinal broth (may refer to all fruticose lichens) (de Candolle 1816; Lebail 1853)
Madras (India)	Unspecified drug (Biswas 1947)

Table 2.20 Ophioparmaceae used in traditional medicines around the world

Culture	Traditional use
Ophioparma lapponica (Räs.) R. W. Rogers & Hafellner	
China	Used externally to stop bleeding from external injury, relieve pain (Wang and Qian 2013)
Ophioparma ventosa (L.) Norman	
China	Same Chinese use as *O. lapponica* (Wang and Qian 2013)

Table 2.21 Umbilicariaceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Lasallia papulosa (Ach.) Llano [syn. *Umbilicaria papulosa*]	
Ekuanitshit (Quebec, Canada) ***uâkuanâpishku***	Tea used for urinary problems (Clément 1990; Uprety et al. 2012)
Umbilicaria spp. Hoffm.	
Dena'ina (Alaska, USA) ***qalnigi jegha*** ("rock ear")	Decoction drunk for tuberculosis and prolonged bleeding. Also used *Peltigera* spp. (Kari 1987)
Inuit (Quebec, Canada)	Used as a tea to treat tuberculosis (Stevens et al. 1984; Sharnoff 1997)
Umbilicaria esculenta (Miyoshi) Minks [syn. *Gyrophora esculenta*]	
Japan ***iwa-take***	An esteemed food that promotes longevity when eaten (Kawagoe 1925; Sato 1968)
Kyeong Gi Do (Korea) 석의버섯 (***seog-eui-beo-seod***)	Used to treat dysentery (Lee 1966)
China 石耳 (***shi-er***, "stone ear")	Used for tuberculosis, spontaneous external bleeding, intestinal bleeding, rectal hernia into the vagina, bloody and cloudy urination, vaginal discharge, snakebites, and cuts. Drink decoction; or apply externally to affected area (Hu et al. 1980; Wang and Qian 2013)

(continued)

Table 2.21 (continued)

Culture and ***folk name***	Traditional use
Umbilicaria hypococcinae (Jatta) Llano	
China	Used for indigestion, distention and pain in stomach duct and abdomen, dysentery, and malnutrition in children. Drink decoction (Wang and Qian 2013)
Umbilicaria mammulata (Ach.) Tuck.	
Attikamekw (Quebec, Canada) ***asine-wakunik***	During difficult childbirth the lichen is boiled and placed on woman's stomach (Raymond 1945)
Nihitahawak Cree (Saskatchewan, Canada) ***asinīwākon***	Made into soup as nourishment for sick person, as it will not upset the stomach. Lichen cleaned, broken into small pieces, and very hot water poured over it and water discarded. Lichen then added to fish broth and cooked 5–10 min, soup thickened as it cooled (Leighton 1985)
Umbilicaria muhlenbergii (Ach.) Tuck. [syn. *Actinogyra muhlenbergii*]	
Chipewyan (Saskatchewan, Canada) ***thetsı́ⁿ***	Used to expel tapeworms. Lichen is burned slightly in a frying pan, mashed well, and then boiled to make a syrup which is drunk. It can be chewed for the same purpose (Marles 1984; Marles et al. 2000)
Cree (Manitoba, Canada) ***asinīwāhkona, wakoonak***, or ***asinīwākon***	Decoction given to someone with a stomachache to "clean out the stomach." (Marles et al. 2000)
Tłı̨chǫ (NWT, Canada) ***kwechi***	Soup eaten as a tonic and for breathing problems (Rebesca et al. 1994; Uprety et al. 2012)
Umbilicaria nanella Frey and Poelt	
China	Used for indigestion, stomachache, dysentery, malnutrition in children, expelling ascarid parasites, vaginal discharges, glomus tumors, and reducing swelling. Drink decoction (Wang and Qian 2013)
Umbilicaria vellea (L.) Ach.	
China	Used for eye infections, bloody feces, and rectal hernia into the vagina (Wang and Qian 2013)

Table 2.22 Icmadophilaceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Siphula sp. Fr.	
Northern Peru ***pelo de piedra***	Unspecified medicine. Oral aqueous application (Bussmann 2006)
Thamnolia subuliformis (Ehrh.) W. Culb.	
Naxi (nw Yunnan, China) ***xuecha***, ***baixuecha***, or ***snow tea***	Used for inflammation. Boiling water added to dry thalli in cup and infusion is drunk after 3–5 min. May be same as Naxi use of *T. vermicularis* (Wang et al. 2001; Fu et al. 2005)
Thamnolia vermicularis (Sw.) Ach. ex Schaerer [syn. *Cladonia vermicularis*]	
Naxi (nw Yunnan, China) ***xuecha***, ***baixuecha***, or ***snow tea***	Used for sunstroke, eye irritation, coughs, sore throat, inflammation, high blood pressure, fevers, epilepsia, and a decrease in vital energy. Boiling water added to dry thalli in cup and infusion is drunk after 3–5 min (Wang et al. 2001; Jiang et al. 2002; Fu et al. 2005; Wang and Qian 2013)
Northwest Yunnan (Tibet) ***xiare***	A widely recognized medicinal plant, tea used to tranquilize the mind and clear ***heat*** (Byg et al. 2010; Ju et al. 2013)
Ayurvedic (Uttarakhand and Himachal Pradesh, India) ***swarn***	Germicide to preserve milk and other dairy products. Lichen is dried and burned, and milk is exposed to the smoke (Sharma 1997)
Bhotia (Uttarakhand, India) ***chhai dhoop***	Used to preserve butter milk. A handful of lichen is put in a wide cup containing burning coal and the smoke directed into the milk. It kills the 1–2 mm long white worms that grow in milk (Upreti and Negi 1996)
South America ***contrayerba blanca***	Used to stimulate the stomach (Lindley 1838)

Table 2.23 Megasporaceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Aspicilia esculenta (Pall.) Flagey	
Tehran (Iran) شیر زاد (***shīr-zāda***); ***chir zadi***; or ***agalactie***	Ingredient in wine and medicinal compounds in ninth to thirteenth centuries Arabic writings (Crum 1993). Used to increase the flow of human milk (Hooper 1937)

Table 2.24 Pertusariaceae used in traditional medicines around the world

Culture	Traditional use
Pertusaria albescens (Hudson) M. Choisy and Werner [syn. *Variolaria discoidea*]	
Europe (early modern era)	Used to treat intermittent fevers, along with *P. amara* (Lindley 1838)
Pertusaria amara (Ach.) Nyl. [syn. *Variolaria faginea*]	
Europe (early modern era)	Used to treat intermittent fevers, along with *P. albescens* (Lindley 1838)
Pertusaria pertusa (Weigel) Tuck. [syn. *Pertusaria communis*]	
Europe (early modern era)	Cure for intermittent fever, more effective for men. Also used for intermittent toothache, and powdered and used to kill worms (Lebail 1853)
Pertusaria velata (Turner) Nyl.	
China	Used to stop bleeding and relieve pain. External use only (Wang and Qian 2013)

Table 2.25 Verrucariaceae used in traditional medicines around the world

Culture	Traditional use
Dermatocarpon miniatum (L.) W. Mann	
China	Used for high blood pressure, as a diuretic, for expelling parasites, for malnutrition in children, for dysentery, for improving digestion, and for abdominal distention. Drink decoction or eat as soup (Wang and Qian 2013)

Table 2.26 Hygrophoraceae used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Dictyonema huaorani Dal-Forno, Schmull, Lücking & Lawrey	
Huaorani (Amazon, Ecuador) ***nẹnẹndapẹ***	Mixed with other bryophytes, made into an infusion, and drunk by shaman to cause hallucinations and call on malevolent spirits to curse people. Also causes sterility (Davis and Yost 1983; Schmull et al. 2014)

Table 2.27 Unidentified lichens used in traditional medicines around the world

Culture and ***folk name***	Traditional use
Xhosa (South Africa) ***mthafathafa***	An unidentified rock lichen is used to treat gonorrhea. Fresh lichen is crushed and mixed with water, and infusion is drunk. Lichen also dried over fire and crushed, and powder is applied to wound's infected area (Matsiliza and Barker 2001). See also Cape area use of unidentified parmelioid lichen
Trentepohlia jolithus [*Lepraria iolithus*]	A non-lichenized algae considered a lichen in early literature. Used for small pox and measles (Luyken 1809)
New Forest (England) ***brighten***	An unidentified lichen is recommended for weak eyes (Wise 1863)
Slieve Aughty (Ireland) ***dub-cosac***	An unidentified lichen is good for heart trouble (Allen and Hatfield 2004)
Brahuis (Balochistan, Pakistan)	An unidentified rock lichen that is extremely bitter is used medicinally in diseases of languor and oppression of the life force. The lichen is dried and crushed. They swallow the powder, and then drink water (Masson 1842; Hooper 1937)
Rotuma (Fiji) ***rimi***	A gray lichen found on coconut tree trunks is used to make medicine used in treating high fevers and/or convulsions (McClatchey 1993)
Dena'ina (Alaska, USA) ***sheh tsadn nde***	A large foliose lichen is used for coughs, tuberculosis, and general sickness. Boil and drink decoction. Also used for bleeding that won't stop (Garibaldi 1999)
Tlingit (Alaska, USA)	Lichens from the ground in the woods are used for sores. Crushed and then heated on rocks with seal oil and mountain goat tallow (de Laguna 1972)
Chipewyan (Alberta, Canada)	White crustose lichens on aspen bark, along with the dead tree periderm, are scraped off and put on cuts and deep wounds to stop bleeding (Marles et al. 2000)
Niitsitapii (Alberta, Canada)	Mixed with kinnikinnick leaves and shredded willow bark to make a smoking mixture (Russell 1973). Cited by Siegel (1989) who added the claim that it was narcotic (Siegel 2013 pers. comm.) and was then cited by Pollan (2001) who added the claim that it was hallucinogenic
Nihitahawak Cree (Saskatchewan, Canada)	White crustose lichens on aspen bark, along with the dead tree periderm, are scraped off and used to stop bleeding and to treat venereal disease (Leighton 1985)
Algonquin (Quebec, Canada)	White crustose lichens on birch bark used for diaper rash and other skin rashes (Black 1980)
Tewa (California, USA) ***k̂uk'owà*** ("rock skin"); ***nǎŋ'a*** ("earth clothing")	***k̂uk'owà*** is pulverized and applied to lips for cold sores, rubbed on sores about a child's mouth, and put into the cavity of a decayed tooth to stop pain. ***nǎŋ'a*** is applied to teeth and gums to cure toothache (Robbins et al. 1916). See also Hopi use of *Xanthoparmelia* sp.
N. Paiute (Nevada, USA) ***tuh-botza-yo-caw-son*** or ***lizard semen***	Black, orange, and yellow lichens on rocks are used as important antibiotics and fungicides. Powdered material is applied as a healing agent to sores, especially mouth sores of children (Train et al. 1941; Sharnoff 1997)

(continued)

Table 2.27 (continued)

Culture and ***folk name***	Traditional use
Western Shoshone (Nevada, USA) ***timbe-boon-goo***	Black, orange, and green lichens on rocks. Diarrhea medicine: soak overnight in water and drink the solution. Smallpox medicine: powder and boil with *Purshia* leaves and dried mountain rat urine; drink half cup of solution morning and night (Train et al. 1941)
Hopi (Arizona, USA)	Yellow lichens on rocks are applied to cheeks to reduce swelling and relieve toothache (Beaglehole and Beaglehole 1935). See also Hopi use of *Xanthoparmelia* sp.
Kewa Pueblo and Hispanics (New Mexico, USA) ***yerba de la piedra*** (Spanish)	Gray lichens are boiled until green and given to one who talks and laughs to himself. Also good for headaches (Kewa). Also rubbed on gums as cure for inflamed gums or powdered and applied on any kind of sore or injury (Hispanics) (Curtin 1965)
Ka'igwu (Oklahoma, USA)	Lichens on north side of tree trunk are dried, powdered, and applied to sore gums for abscesses and teething infants. Also mixed with smoking tobacco for a mildly soporific effect (Vestal and Schultes 1939)
Seri (Sonora, Mexico) ***hast yamása*** ("rock lichen")	Gray foliose and orange crustose lichens on rocks are taken as a tea to induce vomiting (Felger and Moser 1985)
Huastec (Mexico) ***tsakam k'uthay***	An unidentified arboreal lichen is used as an unspecified obstetrical-gynecological medicine and for bleeding. Its name means "little *Tillandsia usneoides*" (Alcorn 1984)
Lacadone (Chiapas, Mexico)	Unidentified lichens are invoked in magical healing of skin eruptions (Sharnoff 1997)
Quichua (Loja, Ecuador) ***musgo de piedra***	There are 7 different colors of lichens on rocks. If all 7 colors are boiled in a drink, it will cure a person with a chronic illness who is about to die (Abel 2009 pers. comm.)
Loja (Ecuador)	An unidentified lichen is used for an unspecified medicine (Bussmann and Sharon 2006)
Denís and Kinja (Amazonas, Brazil) ***baduhu-tsinã*** ("deer snuff")	An unidentified pyrenocarpous lichen on trees is used as a snuff. Yellow powder is collected off the surface of lichen for snuff. Used frequently and induces sneezing (Prance 1972; Milliken et al. 1992)
White crustose lichen Witoto/Bora (Loreto, Peru)	An unidentified white crustose lichen growing on *Rinorea racemosa* is sometimes used (along with other botanicals and ash) to add to the resin of *Virola sebifera* or *V. elongata* to make ***oo'-koey***, a hallucinogenic orally ingested paste (Mckenna et al. 1984; UBC 2014)
Chácobo (Beni, Bolivia)	Five unidentified lichens are used to treat chest and appendix pain, headache, liver problems, and rheumatism (Boom 1987)
Aymara (Titicaca, Bolivia) ***pampa untu*** (wild llama fat)	An unidentified lichen is given to babies as an infusion if they are constipated (La Barre 1948)

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