Journey to Enlichenment:

Lichens in the Atlantic World Food Chain

By Kathleen D. Fowler

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Small, plain, unassuming – lichens go unnoticed by people enamored with bright flowers, showy leaves, and magnificent height. Yet outward appearance is not necessarily an accurate indication of inward beauty. Lichens are a good example. They have provided food and medicine for indigenous peoples all around the Atlantic rim and beyond. For thirty years, I have studied wild foodways and natural medicines, yet until recently, I rarely even noticed lichens, much less made the effort to get to know their uses. That all changed when I discovered a reference to an unknown herb in an ancient, Anglo-Saxon salve recipe.

> This herb is called Stime [Stune]; it grew on a stone,
>
> It resists poison, it fights pain,
>
> It is called harsh [stiff], it fights against poison. (Gordon 93)

What grows on rocks? Lichen. A quick check of my *material medica* revealed an astonishing fact. Many lichens contain usnic acid, a proven antibiotic. Could *stime* be a type of lichen? Thus began this fieldwork project, through which I have gained a new appreciation for these unassuming organisms. Examining several species common both to Europe and the Americas, I will describe them in their natural settings and discuss their known uses on both continents as medicines and foods to various people groups. Recipes for salves and soups, compresses and curries will be provided. From naturalist, to herbalist, to cook, this is my journey to "enlichenment."

Beard Lichen (*Usnea spp.*)

These yellowish-green lichens are densely branched and "hair-like" in appearance, hence their common name, beard lichens. Many of the usneas look similar when they are young, and all seventy-nine species in North America can be identified by the tiny, white, threadlike fungi within each branch (Walewski 136).

Type: Fructose

Range: Worldwide

Substrate: Deciduous and coniferous trees as well as rocks

Usnea (*Usnea spp.*) hanging among shield and map lichens. (Author: Kathleen D. Fowler, February 2013)

Culinary Information

Nutritional Value:

Carbohydrate	83.5 -96%
Protein	2-7.5%
Fat	9%
Vitamin C	
Polysaccharides	

Mucilage
Usnic Acid
(Deane; Sharnoff, Stephen; Moore 9-14)

Flavor: Sweet turning to bitter

Texture: Fibrous

Food Uses: Bulking agent in soups, stews, and curries

Storage: Dried or made into tincture or oil

Method of Preparation: Although small amounts may be eaten raw off the tree, the flavor can be somewhat bitter. When used as a bulking agent in soups, stews, and curries, usnea should be soaked in several changes of water. Baking soda can be added to the water to help remove acid. The soaking water can then be used as a rinse or to water plants (Deane "Usnea").

Daghad Phool (Stone Flowers) Spice Mixture

Lichens are an important foodstuff and medicine in India. Shops often stock a spice mixture called *dagad phool (*stone flowers) containing various Parmeliaceae (especially Parmotrema and Everniastrum species): *Parmelia tinctorum, P. nilgherrense, P. retuculata,* and *P. santialgelia*, sometimes with Ramalina and Usnea added (Richardson, "Medicinal" 93). These lichens (known as *chharila* in India) are also sold loose and added to curry as a bulking agent and mild preservative (Richardson, "Lichens" 190).

Herbal Recipes

Medicinal Properties

Analgesic
Antibacterial
Antifungal
Anti-inflammatory
Anti-pyretic anti-tumor
Antiviral

Medicinal Compounds Found in *Usnea spp.*

(+)-usnic acid (3%)
Alectoric , hiritic, thamnolic, diffractaic (rare), hertillic, and usnaric acids
Anthraquinones
Hirtusneanoside
Various fatty acids
(Rogers *Fungal* 486)

As with most lichens, usnea is not very water-soluble, so either alcohol or oil must be used to make an extract. Here is the basic recipe which I use to make a small batch of usnea oil.

Basic Usnea 1:5 Tincture

4 teaspoons dried usnea powder
½ cup 80-proof Vodka

Grind the dried usnea into a powder; the finer the powder the more surface area to release the medicinal properties into the alcohol.
Add the powder and the Vodka into a glass jar which has been sterilized and which can be tightly closed. Stir the mixture well, making sure that all of the powder is wet.
Wipe the rim of the jar carefully before capping it tightly.
Shake well daily for two weeks.
Pour the mixture through a coffee filter into another sterilized jar for use.

Basic Mild Usnea Oil

1 teaspoon dreid usnea powder
¼ cup olive oil

Preheat oven to 200° F.
Using a pair of sterilized kitchen scissors, clip dried usnea thalli into tiny pieces.
Grind them to fine powder in a mortar.
Place 1 teaspoon of the powder into a sterilized baby food jar and stir.
Set the jar on a cookie sheet and place in the oven. Bake for three hours, stirring occasionally.
Remove from oven and add Vitamin E as a preservative.

This oil can be made into salve by dissolving in a small amount of shaved beeswax.
To make a stronger oil, uses equal parts of usnea and oil.

All species of usnea contain usnic acid which is reported to be more effective than penicillin in the treatment of external wounds and burns (Walewski 136).I use them as one of the ingredients in my homemade skin salves and have had very satisfactory results. Herbalists in Finland use them to treat skin eruptions, wounds, and athlete's foot (Vartia 548), while those in Sweden use them to treat foot blisters (Ahmadjian). I have also read that usnea can be used in a powder form directly on wounds as an antibiotic. Herbalists of Primorye and South Sakhalin, Russia have had very positive results using this method (Moskalenko 234). The Russians also use a sodium salt of usnic acid called Binan to treat second and third degree burns, preventing a secondary infection (Rogers *Medicinal* 14). Binan has been used variously in the treatment of varicose ulcers, *furuncolosis*, impetigo, *Trichomonas*, *Lupus erythematosus*, and *L. vulgaris*. Usnea may even be more effective than Flagyl (metronidazole) in the treatment of *Trichomonas*, a parasite that attacks the uterus and cervical walls, causing infection and tissue damage (Rogers *Medicinal* 14).

As an internal medicine, usnea is recommended by both Hippocrates and Dioscorides for uterine problems (Vartia 547). It is certainly effective against candida and giardia. The Chinese use it as a broad spectrum antibiotic and immune stimulant which is particularly effective against respiratory and urinary infections (Rogers *Medicinal* 11). I could go on; the list of medicinal uses for usnea is a rather lengthy one. Recent studies have shown its effectiveness against gram positive bacteria such as *Streptococcus*, *Staphylococcus*, and *Mycobacterium tuberculosis* (Rogers *Medicinal* 13). Not only is it antibacterial, but also antifungal and antiviral. Add its anti-tumor, anti-inflammatory, anti-pyretic and analgesic properties, and the list of usnea's virtues becomes quite impressive. Usnic acid has also been shown to completely inhibit the growth of tuberculosis (Rogers *Medicinal* 13) and has been effective against MRSA (methacillin-resistant *Staphylococcus aureus*) (Rogers *Medicinal* 14).

Multiple cultures around the world have used usnea in a variety of health products ranging from toothpaste, mouthwash, and deodorant to sunscreen, creams, and ointments. Based on the Doctrine of Signatures, usnea was used to strengthen hair in fifteenth century Europe (Llano 399).

Cultural Tidbits

Recently, usnea has also begun to be used in agricultural products to be control tomato canker, blue staining wood fungus, and tobacco mosaic virus (Rogers 12). Made into sodium usnate and applied at 100-500 ppm, it can be effective against bean rusts, mildews, and the brown rot which affects some stone fruits (Rogers “Medicinal” 12). It strongly inhibits the red bread mold, *Neurospora crassa* (Rogers *Fungal* 491).

Although its medicinal qualities bring it the most attention, usnea has also been used traditionally in many cultures as a source of fiber and dye. Depending on how it is processed and which mordant is used, it will produce a range of colors from yellow to rust (Sharnoff, Sylvia).

Iceland Moss (*Cetraria icelandica; C. nivalis*)

Type: Foliose

Range: Mountainous areas of the northern countries

Substrate: Ground

Iceland Moss (Cetraria icelandica) (Author: Tigerente, 02 July 2005)

Culinary Information

Nutritional Value:

70% lichenin (lichen-starch)
Thallochlor
Fumaric acid
Lichenostearic acid

Cetraric acid
Lichesterinin acid
Prorolichesterinic acid

Flavor: Bitter

Texture: Starchy and gelatinous

Food Uses: Breads, Soups, Stews, Starch (in some cocoa products), Syrup

Storage: Dried and ground into fine powder

Method of Preparation: Soak in water with a 2% solution of birch ash "or thick enough that a potato would float" (Airaksinen 279). The prepared lichen can then be dried, ground and used to supplement flour to make breads and thick soups and stews.

The carbohydrates, lichenin and isolichenin easily form a starchy gel which is used in making custard-like deserts in Finland (Airaksinen 279). In Scandinavia "the hardened jelly of this lichen was often mixed with lemon juice, sugar, chocolate, almonds, etc" (Dannfelt 483-498; Llano *Economic Uses* 395).

Bread moss (*brodmose*) is the Scandinavian name for this lichen because it was used extensively to extend wheat flour and potatoes during times of famine (Rogers *Fungal* 455). When dried and ground it can be used to make a starchy, easy to digest but nutritious food. Thus, it was also sometimes called food moss (*matmasa*).

"In Norway during the years of bad harvest from 1807 to 1814, dried Iceland moss (Cetraria islandica) was used to supplement flour. ... The lichen was soaked in lye (aqueous extract of fresh wood ash) for 24 hr, which presumably neutralized the lichen acids. It was then dried and blended with grain before being ground into flour. Unfermented flat breads or porridge were usually made from the flour" (Richardson 93-108).

The "peasantry of Iceland, Norway and Sweden powder it and mix it with the flour of various cereals and mashed potatoes, from which an 'uncommonly palatable and healthful bread is prepared" (Schneider 20). In Vilhelmina, Lappland "during the 1900s, Cetraria islandica was

used so extensively for bread that it became scarce and picking it became forbidden unless it was to be used for human consumption" (Ahmadjian).

Iceland Lichen Flatbread

1 packed cup Iceland moss (C. islandica after soaking)
1 1/2 c rye flour
1/2 c stoneground whole wheat flour
a pinch of salt
Boiling water as needed
One cup soaked Iceland moss is about two cups dried

The Icelandic moss is soaked for a few minutes in lukewarm water to soften it, then drained and chopped. Mix it with rye flour, wheat flour and salt, then gradually add boiling water and stir well, until you have a stiff but pliable dough. Divide it into 12 equal pieces, roll them out thinly and cut out a round cake, 7-8 inches in diameter. Prick them with a fork. Cook on a griddle or bake at high heat until black spots appear, then turn over and cook the other side. Store in a damp cloth or plastic bag because they dry out quickly. (Greene "Reindeer Moss")

Lichen Milk Soup

a large fistful of prepared Icelandic moss (C. islandica after soaking)
1 litre (4 cups) milk
1 tbsp sugar or brown sugar
Salt

Prepared the lichen then dry it. Pour the milk into a saucepan and heat to the boiling point. Add the Iceland moss and the sugar and simmer for 10 minutes. Add salt to taste and serve. In another version, the soup is simmered for 2 hours, until somewhat gluey. Some versions add far more sugar but that is not traditional (Greene "Reindeer Moss").

Syrup

In the arctic and subarctic areas of Eurasia, a method was developed during World War II in which Iceland Moss was used to make syrup with a glucose yield of 78% of the weight of the dry lichen. The resulting syrup had a brown tinge and a caramel flavor.

Herbal Information

Medical Properties
Phthisis
Anticatarrh
Dyspepsia
Chronic diarrhea
Dysentery
Expectorant
Appetizer
Roborant
Pectoral
Emollient
(Lindley 21; Airaksinen 279; Novaretti 12)

Medicinal Compounds found in *Cetraria spp.*
Lobaric acid
Glucans
Lichenin (polysaccharides 30-40%)
Isolichenin (10%)
Lichenan (17%)
Galactomannan (7.6 %)
Various usnic, salicylic, cetraric, physodalic, and fumaric acids
Estrosterol peroxide
Protolichesterinic acid (0.1-0.5%)
Fumarprotocetraric acids (2-11%)
Aromatic lichen acids (2-3%0
Aliphatic lichen acids (1-1.5%)
Cetrarin
Picrolichenin
Oxalic acid
Furan derivatives
Iodine
Vitamin A
Trace minerals including iron, iodide, and calcium salts
Fatty acid lactones
Terpenes
Mucilage
Fiber
Gums
(Rogers *Fungal* 456)

Lichenin is a polysaccharide similar to betaglucan which is found in oats and barley. It has been found to have some antiviral activity (Rogers Fungal 457). It is soluble in hot water and forms a gel. Isolichinin; however, is soluble in both hot and cold water**.**

Respiratory Ailments: The cetraric acid in the Iceland Moss is readily soluble in alcohol (only slightly soluble in water). Used to make a bitter tonic to relieve chest ailments (2-4 grains/ 0.1-0.25 g).

Basic Iceland Moss 1:5 Tincture

4 teaspoons dried Iceland Moss powder
½ cup 80-proof Vodka

Grind the dried lichen into a powder; the finer the powder the more surface area to release the medicinal properties into the alcohol.
Add the powder and the Vodka into a glass jar which has been sterilized and which can be tightly closed. Stir the mixture well, making sure that all of the powder is wet.
Wipe the rim of the jar carefully before capping it tightly.
Shake well daily for two weeks.
Pour the mixture through a coffee filter into another sterilized jar for use.

Hot Infusion

6 teaspoons dried Iceland Moss powder
2 cups of hot water

Place the lichen powder in a container with a lid. (Do not use plastic.) Heat the water in another pot until it is almost ready to boil then pour it slowly over the herb. Close the lid and let steep for 20-30 minutes. Strain and press the lichen marc.

Cold Infusion

6 teaspoons of dried Iceland Moss powder
2 cups of cold water

Pour the cold water into a container with a lid. Place the powdered lichen in a small muslin pouch and submerge in the cold water. Let sit overnight. Remove the pouch and squeeze the marc.

Anticattarhal

The tincture form is best for both treating respiratory ailments .In Sweden Iceland Moss is thought to be effective for whooping cough and colds as well as asthma, lung diseases, diabetes, nephritis, and wasting illnesses (Ahmadjian). In a present traditional use of Iceland Moss in the Venezia Giulia region (northeast Italy) patients take the prepared lichen to help "reconstituent after tuberculosis, anticatarrhal" (Lokar 234).

Dr. King's American Dispensatory states that Iceland Moss is "used as a demulscent in chronic catarrhs, chronic dysentery, and diarrhea, and as a tonic in dyspepsia, convalescence, and exhausting diseases. Boiled with milk it forms an excellent nutritive and tonic in phthisis and general debility. It relieves the cough of chronic bronchitis" (King qtd. Rogers *Fungal* 456).

In an open clinical trial, one hundred patients with respiratory ailments such as pharyngitis, laryngitis, or bronchitis were given lozenges containing 160 ml of Iceland Moss in aqueous extract. Eighty-six percent of the patients showed strong improvement with no side effects (Rogers *Fungal* 457).

Sore Throat

"A number of companies [in Europe] produce pastilles and pills for sore throats made from [Cetraria islandica] or from the beard lichen Usnea" (Richardson 192). In Finland and Sweden it is "sold at present [1986] in drugstores and 'natural food' stores, recommended for use as an expectorant, appetizer and roborant and to "soften the gut contents" (Airaksinen 279).

Tonics and Laxatives

Iceland moss is both a nutritious and soothing tonic for convalescents. When eaten, it helps to improve both the appetite and digestion and has a slightly laxative effect (Rogers *Fungal* 456). In 1904 it was the only lichen officially used in decoction as a tonic for convalescents (Schneider 24). The bitter principles in the lichen are beneficial for the stomach in both tinctures and infusions.

“Significant amounts of Iceland moss Cetraria islandica are still sold annually in European pharmacies for the home concoction of herbal tonics and laxatives" (Richardson *Lichens and Man* 192). It is used to prepare “a light diet for invalids and a mild tonic” (Lindley 21).

Scurvy

Iceland Moss is used in Iceland and Scandinavia to prevent scurvy (Schneider 20).

Emollient

In the Ubaue Valley, Alpes de Haut Provence Departement, France, a decoction of Iceland Moss is used as pectoral, emollient (Novaretti 12).

Antifungal

In Finland Iceland Moss entered the Pharmacopoeia in 1915. It is used in the manufacture of an antifungal cream called USNO which is used for treating athlete’s foot and ringworm (Rogers *Fungal* 457).

Cultural Tidbits

In Iceland, this lichen is called *fjallagros*, and it was first mentioned in the written laws of that land in 1280 A.D. when people were banned from picking it on other people’s land (Rogers *Fungal* 455).

Iceland Moss was fed to mice to determine its possible toxicity when used as an emergency food in times of famine. The raw lichen, untreated fed to the mice in a 50% solution killed the mice within six days; however, when soaked in the ash-solution and cooked, the lichen sustained the mice for three or four weeks before killing them (Airaksinen 286).

Reindeer Lichen (*Cladina mitis; C. rangiferina; C. stellaris*)

Reindeer lichens grow in delicately branching clumps or mats and range in color from pale green to grayish white.

Type: Fructose

Range: Circumpolar, grows on the ground in open coniferous forests of Canada and the US

Substrate: Thin or poor soil, rocks, forest floors, and mossy areas in full sun

Reindeer Lichen at Hanging Rock State Park, NC (*Cladina spp*.) (Author: Kathleen D. Fowler 4 January 2014)

Culinary Information

Nutritional Value:

100g Dry Weight

1.4%	Ash
5.4%	Protein
32.9%	Fiber
2.1%	Fat
0.501%	Niacin
3.7%	Calcium
0.09%	Phosphorus
94 %	Carbohydrates

(Deane “Reindeer Moss”; Rogers *Fungal* 461)

Flavor: Bitter when raw; slightly sweeter when cooked

Texture: Fibrous when raw; gelatinous when cooked

Food Uses: Tea, vegetable, thickener, syrup, alcohol

Storage: Dried

Method of Preparation: Reindeer Moss is the most nutritious and least acidic of the lichens, but it still must be properly prepared to avoid a severe stomachaches from the acid content. Boil 3 cups of lichen in water with ¼ cup bicarbonate of soda (baking soda) or hardwood ash or use a 1% potash solution for 15 minutes. Drain and repeat. Drain and cover with enough fresh water to barely cover lichen. Simmer until gelatinous; it can then be added to other foods as a thickener (Deane "Reindeer Moss").

Chinese Method of Preparation: Boil lichen in water for 30 minutes; then soak in several changes of water. Drai; then either steam it to mix with other ingredients or dry it to add to flour as a thickener for soups (Deane "Reindeer Moss").

Tea

French fur traders in Quebec sometimes used *Cladina rangiferina* as a substitute for tea when provisions ran low (Kalm qtd. in Sturtevant 177). Boil the lichen in water for 15 minutes (Deane "Reindeer Moss"). Beware, such tea may produce a terrible stomachache due to the high acid content.

Thickener

Prepare as described above. Add the gelatinous lichen to soups and stews or dry it and mix it with flour to use as a thickener.

Vegetable

Small amounts of Reindeer lichen can be nibbled or crumbled into soup. However, the acid content is so high, that eating large amounts that have not been properly prepared can cause

severe stomach pains. Norwegians sometimes eat Reindeer lichen (*Cladina rangiferina*) and believe the taste to be crisp and agreeable though bitter (Sturtevant 177). To remove the bitteness, the Gwich'in of the Makenzie delta boil the lichen for an hour then fry it until crispy (Rogers *Fungal* 460).

The Labrador Eskimos will eat Reindeer moss in times of starvation because it contains "enough nourishment to sustain life" (Freeman 34). More frequently, they will eat it as the partially digested contents of caribou stomachs, a practice which is shared by the Inuit, Igloolik, Copper, Caribou, Netslik, Baffin Island, Nuamiut, and Polar Chipewyan peoples (Kuhnlein 38). The best method of preparing partially digested Reindeer lichen is to freeze it while still inside the stomach of the caribou. It can then be sliced and put into stews, etc (Deane "Reindeer Moss"). Another way is to rub it on meat to tenderize it and enhance the favor (Rogers *Fungal* 460). The lichen can also be hung up to age for a week then mixed with fat, marrow, and berries (Rogers *Fungal* 460).

Syrup

During World War II, a method of using Reindeer lichen (Cladina mitis) for making glucose was developed because beet sugar was scarce and potatoes and grains were scarce. The glucose yield was 75% of the dry weight of the lichen (Llano 385). The following excerpt from the an article by George Llano entitled "Utilization of Lichens in the Arctic and Subarctic" describes the process.

> The methods used in harvesting lichens are very similar to those employed by farmers in Norway for gathering lichens for fodder. The manufacturing techniques involve six steps, and after the fourth the process must be carried to completion rapidly to avoid fermentation. First, the bitter taste is removed by steeping the lichen mass at a temperature of 12º C. in two changes of potassium carbonate dissolved in water; the first soaking lasts five hours, the second 12 hours. A solution made up of wood ash consists of seven times its volume of hot water, being equivalent to a 1-2% solution of pearlash. The mass is then rinsed in cold water and tested by taste. Hydrolysis, the second step, takes from eight to ten hours and is controlled at a temperature of not more than 100º C. Sulfuric acid is

added in quantities equal to the weight of the dried lichen mass. When the filtration speed of the hydrolyzate through a paper filter approaches that of water, hydrolysis is completed. Neutralization is carried out by addition of 1.5 kilo of lime to one kilo of acid until the emulsion has the consistency of sour cream; temperature is maintained at 60º to 70º C. When neutralization reaches a pH of 5.5, which is determined by taste or with the aid of litmus dye (lichen dye), the process is taken to the next step, filtration. Filtration is accomplished in Dutch Filters at a temperature of 60º C to 70º C. Although filtrates may vary in color, the best is described as transparent with a dark-yellow brown color. Following this step, the solution is cleared and bleached by adding activated charcoal in quantities of 0.5 to 1% by volume. The powdered charcoal is thoroughly stirred in with a paddle at a temperature of 70º to 80º C. The charcoal is removed by filtering or by centrifuge. The syrup should be mildly sweet, without any bitterness or other flavoring, colorless, transparent or slightly yellowish. Excess water is removed by evaporation; to avoid charring, the recommended method is that used in making American maple sugar. Properly evaporated lichen molasses consists of 65 to 70% glucose with a density of from 38 to 40º Baumé. At this density, the lichen molasses or glucose may be kept indefinitely in containers without spoiling.

Alcohol

A whisky made in Denmark and a brandy made in Sweden from Reindeer lichen were so popular that over-harvesting began to endanger the lichen. The respective governments eventually had to ban production of the alcohols (Rogers *Fungal* 460).

Herbal Information

Medicinal Compounds Found in Cladina spp.

54-63% lichenin acid

Usnic, fumarprotocetratic, perlatolic acids

Small amounts of rangiformic, psoromic, pseudo-rangiformic, and ventoric acids
Atranorin
Various polysaccharides (nigeran, galactomannan, arabinitol, volemitol, and mannitol)
Proteins
Ergosterol
Trace amounts of vitamin D
Alpha trehalose and sucrose
Umbilicin
Hangokenols A and B
Barbatic acid
(Walewski 38, 84-85)

Inuit Remedy for Eye Infections

Inuit of Baffin Island boil reindeer lichen to make a broth which is then used for sickness and eye infections (Rogers *Fungal* 461).

Ojibwa Newborn Bath

The Ojibwa of Northeastern North America historically made decoction of Reindeer lichen in which to bathe newborns to give them strength (Walewski 84).

Finish Remedies for Diarrhea and Respiratory Infections

For a laxative, boil reindeer lichen in water. Boil it in milk for respiratory infections (Rogers *Fungal* 461).

Cultural Tidbits

The d-usnic acid in reindeer lichen (Cladonis stellaris and C. mitis) has been shown to inhibit the growth of Staphylococcus aureus and Bacillus subtilis while the hangokenols A and B have recently been tested for activity against MRSA (methicillin-resistant S. aureus) and VRE (vancomycin-resistant Enteroccispecies) (Yoshikawa 89-92).

Rock Tripe (Umbilicaria muhlenbergii; Umbilicaria vellea)

Type: Foliose

Range: Worldwide

Substrate: Rocks

Umbilicaria spp. at Hanging Rock State Park, NC. (Author: Kathleen D. Fowler, 17 Feb. 2013)

Culinary Information

Nutritional Value: 1/3 more calories than equal amounts of honey, cornflakes. or hominy ("Rock Tripe").

Flavor: Bland

Texture: Gelatinous

Food Uses: Soups, stews, garnish, vegetable

Storage: Keep fresh rock tripe in a paper bag in the refrigerator for several days or dry it and store in air-tight glass or metal containers.

Method of Preparation: Break the rock tripe into pieces, pour very hot water over them, and let them soak until soft. Discard the water as it will contain a large amount of bitter, irritating acids found in the lichen. It is also not a bad idea to add a little ash or baking soda to the water to help neutralize the acid and make the rock tripe more digestible. The prepared rock tripe can then be used in much the same way as mushrooms in recipes.

Modern Rock Tripe Soup by Vickie Shufer

2 quarts water
½ cup rock tripe, broken up into small pieces
1 medium onion, chopped
2 stalks celery, chopped
2 carrots, chopped
2 tablespoons butter or vegetable oil
2 tablespoons wild herb seasoning
½ teaspoon evening primrose seeds
Salt, to taste
1 cayenne or chili pepper, cut in half and seeds removed
1 teaspoon filé powder

Wild Herb Seasoning

1 cup dried greens (cress, purslane, stinging nettle, kudzu)

¼ cup dried saltwort (if available)

1 tablespoon dried wild chives (wild onion and garlic tops)

¼ teaspoon garlic mustard seeds (or other mustard seeds)

¼ teaspoon evening primrose seeds

1. Blend ingredients in blender or coffee grinder.

2. Use as a sprinkle on your favorite vegetable dishes, salads, or soups.

Filé Powder

Filé powder is used in gumbo recipes as a thickener and is sold in specialty stores and gourmet shops. If you look at the ingredients, the only thing listed is sassafras leaves. You can make your own filé powder by gathering the young leaves and either dehydrating them in a dehydrator or

spreading them on a screen until dry and then powdering them. Add to the cooked dish after you have removed it from the heat. Cooking with filé will result in a stringy, unappealing texture.

1. In a medium soup pot, bring water to a boil and add the rock tripe. Reduce heat to medium.
2. In a skillet over medium heat, sauté the onion, celery, and carrots in butter or vegetable oil for 10–15 minutes. Add Wild Herb Seasoning and evening primrose seeds and mix well.
3. Add to soup pot along with salt and cayenne pepper. Simmer for 1 hour.
4. Remove from heat and add filé powder. (Vickie Shufer)

Modern Rock Tripe Crackers by Vickie Shufer

¾ cup whole wheat flour
1 cup all-purpose flour
¼ cup nut flour
2 tablespoons sunflower seeds, ground
1 teaspoon salt
1½ teaspoons baking powder
¼ cup rock tripe, ground
¼ cup sour cream
1 tablespoon butter, melted
½ cup ice water

1. Preheat oven to 350°F.
2. In a large bowl, mix together the dry ingredients.
3. Stir in sour cream and melted butter.
4. Add the ice water and knead lightly.
5. Roll to one-eighth-inch thickness on a floured surface. Add more flour as needed to prevent the dough from sticking. Cut to desired shape and size.
6. Place on a lightly greased cookie sheet and prick tops with a fork.
7. Bake 10 minutes or until lightly browned.

Japanese Iwatake (Rock Tripe)

The Japanese consider rock tripe a delicacy. They call them *iwatake* (岩茸 or 石茸 rock mushrooms) and will serve them as part of a special tea ceremony or as a special natural food in traditional *ryokans* (Rogers *Fungal* 450). The iwatake are boiled until tender then seasoned with a little rice wine vinegar or sesame paste. They are added to miso soup or fried as tempura.

Korean Seogi (Rock Tripe) Garnish

Soak the *seogi* (석이버섯 manna lichen, stone ears) in room temperature water for about twenty minutes; then rub the seogi with the fingers to clean them, drain the water, and pat them dry. Cut the seogi into thin strips and mix with one teaspoon of sesame oil and ½ teaspoon of soy sauce. Use as a garnish for other dishes ("Daehajjim").

Herbal Information

Medicinally, this species contains gyrophoric acid and is active against gram positive bacteria. A study in Japan found that a sulfate isolate from rock tripe showed some inhibitory effect on HIV-1 in vitro (Rogers *Fungal* 450).

Cultural Tidbits

Looks like a piece of leather, tastes like a piece of leather – rock tripes are edible and some cultures consider them a delicacy (mostly Asian), but the majority of western field guides I consulted did not recommend trying them except in case of emergency. Walewski writes, "Although these lichens were among the many unique substances eaten by starving adventurers, some preferred to eat their boots before resorting to Rock Tripe. *Umbilicaria* are generally difficult for humans to digest; they have a high acid content, they cause diarrhea, and they don't taste so good either. May you never be forced to choose between rock tripe and your hiking boots" (79). With a recommendation like that, I did not feel like testing my luck with these intriguing lichens. However, I did learn that the Woods Cree of Saskatchewan consider them good nourishment (Rogers *Fungal* 450). In contrast, the Chipewyan call them "rock dirt" and feed them to their dogs (Rogers *Fungal* 450). Most sources consider them a survival/emergency food, citing reports that George Washington's troops ate them at Valley Forge during the hard winter of 1777.

Rock tripe get the name *Umbilicaria* from the single cord that attaches them to the rock face. Their tops are smooth and brown while their undersides are velvety black, so they make quite a spectacle clustered together on a rock face. They also make a spectacular red dye called

corkir which is used to color Tartans in Scotland (Rogers *Fungal* 451). The same dye will produce purple if treated with urine.

Ruffle Lichens (*Parmelia spp.*)

Ruffle lichens are often grey on top and white underneath. Tiny, black cilia can sometimes be found along the edges.

Ruffle Lichen (*Parmotrema hypotropum*) and Oakmoss (*Evernia prunastri*) (Author: Kathleen D. Fowler Feb. 2013)

Type: Foliose

Range: Worldwide

Substrate: Trees

Culinary Information

Nutritional Value/Medicinal Compounds:

Atranonin

Chloroatrononin

Methyl Orsenillate

Orsenillic acid

Lecanoric acid

Norstictic acid

Flavor: Nutty turning to bitter

Texture: Leafy

Food Uses: Spice, Bulking agent in curry

Storage: Dried

Method of Preparation: When used as a bulking agent in soups, stews, and curries, lichens should be soaked in several changes of water. Baking soda can be added to the water to help remove acid.

Daghad Phool

Shops often stock a spice mixture called *dagad phool (*stone flowers) containing various Parmeliaceae (especially Parmotrema and Everniastrum species): *Parmelia tinctorum, P. nilgherrense, P. retuculata,* and *P. santialgelia,* sometimes with Ramalina and Usnea added (Richardson, "Medicinal" 93). These lichens (known as *chharila* in India) are also sold loose and added to curry as a bulking agent and mild preservative (Richardson, "Lichens" 190).

The Chettinad region of India uses a lichen called kalpasi (Black Stone Flower) as a spice. The following recipe from *Spice India Online* includes it as part of the masala.

Chettinad Mutton Curry

Ingredients -1

2	Star anise petals
2	Cardamons
2	Cloves
2	Cinnamon sticks (very small)

2 pinches	Nutmeg powder (grated from whole nutmeg)
4	Dried red chilis
6 T	Corriander seeds
1 t	Cumin seeds
2 t	Fennel seeds
2 t	Black peppercorns
1 T	split roasted chickpeas
2 t	Poppy seeds
6t	Dry coconut flakes
4 cloves	Garlic
2”	Ginger
2	Small green chilis
3	Curry Leaves
3 Stlks	Coriander leaves
1	Mace petal

Ingredients –2

2 lbs.	Mutton (with bones)
1 T	Lemon juice
¼ t	Salt (for marinade)
¼ t	Turmeric (for marinade)

Ingredients -3

3	Onions (or 30 shallots)
1	Tomato (diced)
2	Bay leaf
3	Black Stone Flower Petals (Kalpasi)
2	Kapok buds (Cotton Silk Tree) (Marathi moggu)
10	Curry leaves (for tempering)
4 stlks	Coriander leaves (for garnish)
¼ t	Turmeric powder (for gravy)
1 ½ t	Salt (or to taste)
4 T	Oil
1 ½ cup	Water for pressure cooking

Combine the ingredients from list 2 in a bowl. Mix well. Marinate for one hour before cooking. Grind all of the dry ingredients in list 1; then add the moist ingredients and grind to a smooth paste. Add a little water if necessary to mix smoothly.

In a pressure cooker, heat oil, add bay leaf, kalpasi, kapok buds, and curry leaves. Toast them slightly, add the onions, and fry until translucent. Add the marinated mutton and turmeric

powder, ground masala paste, and tomatoes. Brown; then add water and salt. Cover with a lid and pressure cook until tender. Garnish with coriander and serve with rice.

Herbal Information

They can be applied externally as a poultice on the lower back and renal areas to promote urination, and as a liniment or an incense they are used as a remedy for headaches (Nadkarmi 922). The *Indian Materia Medica* lists ruffle lichens as "bitter, febrifuge, astringent, relovent, emollient, demulcent, and … diuretic" (Nadkarmi 922). As a soporific and sedative they have been used in the treatment of diarrhea, dyspepsia, spermatorrhea, amenorrhea, and dysentery (Nadkarmi 922). They are also recommended for kidney stones, enlarged spleen, bronchitis, hemorrhoids, sore throat, and pain in general (Rogers *Fungal Pha*rmacy 476).

Chinese traditional medicine uses the ruffle lichen, *Parmotrema tinctorum* to stop bleeding, to detoxify, and to cure ringworm. Called Whitehead Yan Mo flowers, the lichens are placed on bleeding wounds and wrapped into place. If an unidentified poison is in the wound, the lichen is crushed, mixed with vegetable oil and spread over the affected area. A tincture is made to treat ringworms ("21 Food and Beverage Online").

Cultural Tidbits

Ruffle lichens are an important foodstuff and medicine in India. According to Richardson, the amount of lichens collected for food "places a heavy burden on the diminishing lichen flora of the Indian subcontinent" (193). Who gets priority when people are hungry? The question is not always an easy one to answer. The fact that lichens are slow growing makes them difficult to cultivate as a domesticated food source, but they can be highly nutritious is prepared properly.

Ruffle lichens are also collected in India for cosmetic and medicinal purposes. Ruffle lichen are dried and powdered for use in a preparation for washing hair (Nadkarmi 922).

Wood Ear/ Tree Ear (*Auricularia auricula*)

Wood ears are classified variously as either tree jelly lichen or fungus.

Type: Foliose

Range: Temperate and subtropical zones worldwide

Subtrate: Hardwood trees

Wood ears (Auricularia auricula) (Author: Kathleen D. Fowler, February 2013)

Culinary Information

Nutritional Values: Wood Ears (*Auricularia auricula*)

100g Dried Wood Ears

370 kcal.
10.6g Protein

0.2 g	Fat
65 g	Carbohydrates
375 mg	Calcium
201 mg	Phosphorus
185 mg	Iron
0.037 mg	Carotene
	Various Polysaccharides

(Hobbs 73; Gilbert 126-145)

Flavor: Nearly none

Texture: Gelatinous

Food Uses: Add to soups and stews; stir-fry, sauté, bake, roast, braise, grill.

Storage: Fresh wood ears can be kept in a paper bag in the refrigerator for couple or days. Dried wood ears keep for longer periods in air-tight glass or metal containers in a cool, dry cabinet. Do not store wood ears in plastic as they will mildew.

Method of Preparation: Clean fresh wood ears and prepare like most edible mushrooms. Dried wood ears can be reconstituted by soaking in warm water for ten minutes.

Wood ears are utilized more for their medicinal rather than their edible qualities in countries around the Atlantic rim; however, Asian cultures have long prized this tree jelly lichen for both. Here are a couple of simple and very common recipes.

Simple Hot and Sour Soup

6 cups chicken stock (turkey stock works well too)
2-3 dried chilies
1 T soy sauce
¼ cup small dried wood ear mushrooms
1 can bamboo shoots, drained and slivered
½ cup firm tofu, diced
1 egg
2 T rice wine vinegar
1-2 green onions, finely chopped
Salt and ground black pepper to taste

Bring the chicken stock to a boil and add the dried chilies, vinegar, and soy sauce. Turn down the mixture and let simmer until chilies begin to rehydrate. Meanwhile, wash the dried wood ears and soak in warm water. When rehydrated, add to soup stock along with the bamboo shoots.

Add tofu. Crack the egg into a small bowl and blend with a fork. With the soup at a very slow boil, slowly add the egg to the soup stock, stirring gentling with the fork. Add salt and pepper to taste. Garnish with chopped green onions. Enjoy!

Mu Shu Pork

Have you ever noticed that your favorite recipes are always the ones with the most food stains on the cookbook page? Well, this is one of mine. I transposed it straight from my old, well used copy of *Yan Can Cook*.

3 T oil
2 cloves garlic, finely minced
½ lb. boneless pork, cut into thin strips
¼ cup dried wood ears, soaked and shredded
½ cabbage, thinly shredded
½ small carrot, thinly shredded
1 small zucchini, thinly shredded
2 stalks green onion, 1" pieces
1/3 cup broth
3 eggs (beat, make into thin omelet; then shred)
¾ t salt
1 ½ T soy sauce
½ t sugar
1 t sesame oil
Dash of white pepper
¾ t cornstarch solution
4-5 T hoisin sauce (for serving)
1 dozen wrappers, warmed

Heat the wok with oil and garlic for a few seconds over high heat. Put in pork and stir-fry for 1 ½ minutes. Add the wood ears, cabbage, carrot, zucchini, green onion, and broth. Stir for about two minutes. Add the shredded omelet and remaining ingredients, except hoisin sauce. Cook until thick and clear. Remove to a bowl or platter. To serve, spread a thin layer of hoisin sauce over a wrapper and place 3 T of the Mu Shu Pork mixture in the center. Wrap it up and enjoy!

Mu Shu Wrappers

Mu Shu wrappers are available at most grocery stores, but if you want to try your hand at making them, here is Yan's recipe.

2 cups flour, sifted
¾ cup hot water
1 t sesame oil
Extra oil to brush pancake
Extra flour for dusting board

Combine ingredients and knead until smooth. Separate into 16-20 portions and roll out into thin pancakes, 6"-7" in diameter. Cook two pieces at a time: brush one pancakes lightly with sesame oil. Place another pancake on top and press lightly to join. Brown each side lightly on medium heat. Remove from heat and throw on the counter top. It should break into the two original pancakes.

Herbal Information

Medicinal Properties

Astringent
Anticoagulant
Antitumor
Hpoglycemic
Cholesterol-lowering properties

(Yoona; Misaki; Yuan; Francia)

German Home Remedy for Styes and Infected Eyes

Soak wood ears in rose water over night and apply to stye/infection (Wells 18).

English Home Remedy for Sore Eyes

Make an infusion in water to relieve sore eyes (Hardin 120).

English Sore Throat Remedy (16th century)

In 1597, John Gerard recommended in his herbal that they be either boiled in milk or steeped in beer to make a liquid to sip as a cure for sore throat (Harding 173). Other herbalists recommended using vinegar instead of beer [Clusius Carolus (1601); John Parkinson (1640); John Pechey (1694)] (Barrett 14; Harding 120).

Chinese Heart Remedies

The anticoagulant property of wood ears has been known in China for centuries. Traditional medicine uses them to quicken the blood, decrease symptoms of heart attack and stroke, and increase qi. They are also believed to increase longevity (Harding 143).

Cultural Tidbits

One European variety of wood ears grows only on elder trees. According to legend, Judas hanged himself on an elder tree after he betrayed Jesus. The wood ears sprouted first from that elder to serve as a reminder of his treachery (Harding 118). Until the nineteenth-century, they were called Judas' ears, and Christopher Marlowe mentions this legend in his *Jew of Malta.* In Act IV, while examining the Jew, Barabas, Ithamore comments insultingly, "The hat he wears, Judas left under the elder when he hanged himself" (IV.vi.72). However, it was because of this association with the hanged Judas, that wood ears were believed through the Doctrine of Signatures to relieve throat problems such as quinsy (Harding 120).

Wood ears are highly prized and are one of the first cultivated lichens/fungi in China. The first documented evidence of their domestication is found in *Pen Tsao Kung Mu* written by Li Shih-Chen in the Tang Dynasty (618-907 C.E.) (Chang 374). Li quotes Tang Ying-Chuan as recommending steamed bran be put on logs and covered with straw to encourage the growth of wood ears (Chang 374). The Japanese, however, prefer to wildcraft them, going out in the winter to collect the ones which have fallen to the ground.

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