Economic Importance of Lichens
Lichen as Food

*Lecanora esculenta* considered as the “MANNA LICHEN”

Location
Highlands of North Africa and Deserts of West-central Asia

Species
*Lecanora esculenta*

Formation & appearance
Thick wrinkled crusts on rocks. Detached as they grow older

Sudden appearance of large quantities of lichens blown around by winds or washed into depressions by rainshowers is termed “MANNA LICHEN”
# Lichens as Food

<table>
<thead>
<tr>
<th>Lichen species</th>
<th>Common name</th>
<th>Country used</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Cetraria islandica</em></td>
<td>Iceland moss</td>
<td>Scandinavian countries</td>
</tr>
<tr>
<td><em>Umbilicaria mühlenbergii</em></td>
<td>Iwatake</td>
<td>North Africa and Deserts of West Central Asia</td>
</tr>
<tr>
<td><em>Umbilicaria esculenta</em></td>
<td>Iwatake</td>
<td>North America</td>
</tr>
<tr>
<td><em>Peltigera canina</em></td>
<td>Dog lichen</td>
<td>India</td>
</tr>
<tr>
<td><em>Ramalina sinensis</em></td>
<td>Cartilage lichen</td>
<td>Nepal and India</td>
</tr>
<tr>
<td><em>Bryoria fremontii</em></td>
<td>Black lichen</td>
<td>North America and British Columbia</td>
</tr>
</tbody>
</table>

**Iwatake**
Delicacy in Japan

**Umbilicaria esculenta**

**Iceland moss**
*Cetraria islandica*

[Images: http://www.arcticatlas.org/species/photos/300/ceis60_3.jpg](http://www.arcticatlas.org/species/photos/300/ceis60_3.jpg)
Lichens as Food flavoring agents

Species mixture of *Parmelia, Heterodermia, Pyxine* and *Physcia* are extensively used to increase the flavor of the Indian spicy dish 'Briyani' from Kashmir to Kanyakumari.

Vernacular Names

*Sanskrit*-Sailaja, saileya; *Hindi*-Charila, Pathar-kaphul; *Telugu*-Rathipoovvu; *Tamil*-Marappasi, Kalpasi, maraottu; *Punjabi*-Chalchalira, charcharila, ausneh, hiunsew; *Malayalam*-Kalpasi, *Marathi*-Mota dagada phul, barik dagada phul.

A wild collector will approximately destroy more than 45 x $10^3$ cm$^2$ well grown lichen cover at one shot for collecting 1 Kg of lichen biomass.

On the contrary the foliose lichen can grow up to 2-3 mm/year.

Once destroyed partially it will take min. 2-5 years to attain the recollecting stage.
Lichen as Fodder

Some of the fodder species of lichen include *Cladonia rangiferina*, *C. alperstris* and *C. sylvatica*

Other fodder species include *Cetraria*, *Stereocaulon* and *Alectoria*.
Lichen acids were the source of important dyes for cotton and wool in medieval Europe.

Two purple and red dyes, orchil and cudbear, were obtained from the lichens *Roccella* and *Ochrolechia*.

Lichen dyes were dissolved in human urine, and the yarns were immersed in this mixture.

Ammonia salts in the urine functioned as mordants to make the dyes permanent.
Poison to Wolves

*Letharia vulpina* ("wolf lichen")

This lichen is poisonous that the Achomawi in Northern California used it to make poison arrowheads, mix the lichen with meat and poison wolves.

The Okanagan-Colville made a weak tea of it to treat internal problems, and it was a Blackfoot remedy for stomach disorders.
The tinctorial properties of lichens are due to the presence of lichen secondary metabolites, some of which contain chromogens from which the colouring matter is derived.

Under the combined influence of ammonia and oxygen, lecanoric acid and erythrin in *Roccella montagnei* give orcin and subsequently orcein, which are the colouring matters of orchil and which, in the presence of sodium or potassium carbonates, form azolitmin and erythrolitmin (colouring matters of litmus).

- Wealth of India
"Oakmoss lichen"
(Evernia prunastri)

*Evernia prunastri* (oak moss), *Pseudevernia furfuracea* (tree moss) and *Ramalinae* spp. are mostly used as ingredients in soaps, cosmetics, after shave lotions or perfume for a peculiar, earthy, mossy fragrance. This species is harvested commercially in south-central Europe, and then sent to France where it is used in the manufacture of fine perfumes. The lichen acts as a fixative for other scents, and also adds a subtle herbal fragrance of its own.
Lichens in Medicine

- *Umbilicaria esculenta* found to contain anti-HIV substances. *Usnea* spp. found to contain anti-cancer compounds.

- *Parmelia* spp. are used in wound healing in parts of Eastern Ghats, India.

- Lichens contain several secondary metabolites, which are antibiotic in nature.

- **Skin Allergens: Evernia prunastri** – for wild lichen collectors and the users of the perfume containing extracts of this lichen
**List Of Ingredients Of Navratna Oil**

<table>
<thead>
<tr>
<th>S.N o.</th>
<th>Indian Name</th>
<th>English Name</th>
<th>Botanical Name</th>
<th>Purpose Of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Latakasturi</td>
<td>Musk Mallow</td>
<td>Hibiscus</td>
<td>Keeps head cool.</td>
</tr>
<tr>
<td>3.</td>
<td>Kakoli</td>
<td>-</td>
<td>Roscoea purpurea</td>
<td>Refrigerant and it has good aromatic odour.</td>
</tr>
<tr>
<td>5.</td>
<td>Gatella</td>
<td>-</td>
<td>Polygonum</td>
<td>Cures itches and prevents bad odour.</td>
</tr>
<tr>
<td>6.</td>
<td>Muramansi</td>
<td>-</td>
<td>Erythrina stricts</td>
<td>Relieves burning sensation.</td>
</tr>
<tr>
<td>7.</td>
<td>Kunch</td>
<td>Jequirity</td>
<td>Abrus precatorius</td>
<td>Prevents pre-mature hair fall, relieves headache and useful in</td>
</tr>
<tr>
<td>9.</td>
<td>Musta</td>
<td>Nut Grass</td>
<td>Cyperus rotundus</td>
<td>Helpful in hair growth.</td>
</tr>
<tr>
<td>10.</td>
<td>Gandhamatra</td>
<td>-</td>
<td>Paederia foetida</td>
<td>Used as aromatic.</td>
</tr>
<tr>
<td>12.</td>
<td>Gulab Phool</td>
<td>Rose</td>
<td>Rosa damascena</td>
<td>Aromatic, keeps brain cool and refrigerant.</td>
</tr>
<tr>
<td>13.</td>
<td>Kesut</td>
<td>-</td>
<td>Eclipta alba</td>
<td>Promotes hair growth, improves blackening of hair, relieves</td>
</tr>
<tr>
<td>14.</td>
<td>Brahma</td>
<td>Thyme Leaves</td>
<td>Bacopa monnieri</td>
<td>Prevents hair fall, refrigerant and improves memory.</td>
</tr>
<tr>
<td>15.</td>
<td>Karpoor</td>
<td>Camphor</td>
<td>Cinnamomum</td>
<td>Cooling effect.</td>
</tr>
</tbody>
</table>

**Lichen Parmelia perlata in Ayurvedic Medicine**
Lichen *Parmelia perlata* in Ayurvedic Medicine

Antifungal, antibacterial and anti-inflammatory properties
Promotes spermatogenesis by improving the testicular, seminal vesicle and epididymal & Seminiferous tubules, brings about improvement in semen quality.

Confido* is a non-hormonal therapy acting through the neuro-endocrine pathway, regulates the process of ejaculation.

Speman promotes spermatogenesis by improving the testicular, seminal vesicle and epididymal functions.

V-Gel possesses antifungal, antibacterial and anti-inflammatory properties, effective in the treatment of vaginitis and cervicitis.

Animal health

**SPEMAN VET** (powder)

**NEFROTEC** (tablets)
Reference

Agathiar Gunappaadam

Basic Siddha Medicine book explaining nature of herbs in the form of Hymn

Siddha Vaithiya Pathaarth Thiru Villakkam
Sri Kannusamy Pillai
B. Ratthina Nayakkar & Sons
26, Venkatrama St
Chennai 79
Lists about 12 lichen drugs
Pharmaceutical products using *Usnea spp.* as ingredient

**Supplement Facts**

- **Serving Size:** 40 Drops
- **Servings Per Container:** 22.5
- **Amount Per Serving:** mg
- **Proprietary Blend:** 90 mg* Extracts from *Usnea Lichen* (Usnea spp.), UVA Ursi Leaf (Arctostaphylos uva ursi), **Pipsissewa Herb** (Chimaphila umbellata), **Echinacea Supreme** (Echinacea angustifolia root, Echinacea purpurea root, flower head and seed), 40-50% Pure Grain Alcohol USP and Spring Water.
- **Average Herb Strength Ratio:** 1:1.25

*Daily Value not established.

**SPILANTHES**

- **USNEA COMPOUND**
- **Anti-Fungal Remedy**

**Männerserie - spagirische Kosmetik von Jurlique.**

- **Deodorant Spray -** Aluminium & Zinkfrei. Euro 21,80
  - [http://www.absolutelythepurest.com/HEALTHSITE/herbal/spilanthesusnea.gif](http://www.absolutelythepurest.com/HEALTHSITE/herbal/spilanthesusnea.gif)

- **After Shave Herbal Water for Men.** Euro 27,70

**Fytotherapie:**

- **Weerstand:**
- **Yeast & Fungal D'Tox** Euro 18,25
  - [http://www.azmira.com/ProductHerbalExtracts.htm](http://www.azmira.com/ProductHerbalExtracts.htm)

**Fitosept oriblets**

- **Sodium usninate ... 0.1mg**
- **Menthol ............ 2.0mg**

- www.yu4you.com/slike/male/ostalo/490.jpg

**Usnea sp.**
Lichenometry

Lichenometry is the method of determining the age of substrates using lichens. Growth rate of lichens is characteristic and it is used in the lichenometric analysis of substrates.

1. Geologists go to a number of rock fall sites
2. Measure the largest lichens on each rock face
3. Graph of the frequency of each size of lichens
4. Convert size of lichens to years

A. Premise is based on the assumption that an earthquake causes rocks to fall
B. A new rock face is exposed to the elements
C. Lichens colonizes the new rock face
D. Lichens grows at a relatively steady pace

Rhizocarpon geographicum – species used in lichenometry
Lichens in Air Pollution and Biomonitoring

• The symbiotic nature and lack of protective, conductive and assimilatory tissues make lichens more dependent on atmospheric humidity and nutrients.
• Lichens are very responsive to environmental stressors, including changes in forest structure, air quality and climate.
• Epiphytic lichens provide a clear indication of potential air quality and used to monitor the ecosystem.

For more information on lichen in air pollution and biomonitoring see section **Air Pollution and Biomonitoring**