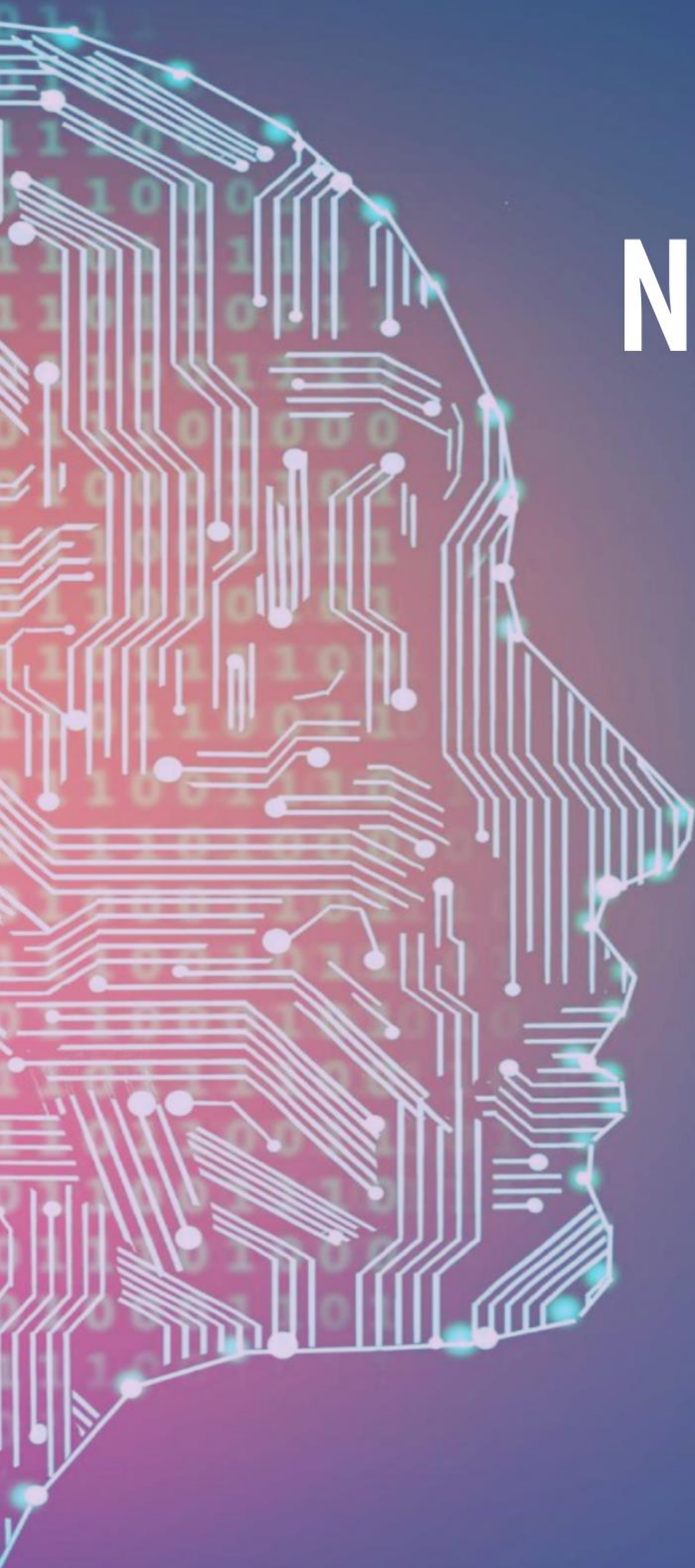


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<u>ТАҲРИР ҲАЙЪАТИ</u>	<u>ТАҲРИРИЯТ АЪЗОЛАРИ</u>
<p>Бош муҳаррир – У.О.Худанов т.ф.н., доц.</p> <p>Масъул котиб- Ш.Урозов</p>	<p><u>Бош муҳаррир</u> Худанов Улугбек Ойбутаевич, доц., к.т.н.</p> <p><u>Тахририят аъзолари:</u></p> <ol style="list-style-type: none">1. Яхшиева З- к.ф.д., профессор ЖДПУ2. Шилова О.А.-к.ф.д., профессор. И.В. Гребенщиков номидаги Россия ФА Силикатлар кимёси институти3. Маркевич М.И. -ф.м.ф.д.. профессор. Беларусия ФА4. Elbert de Josselin de Jong- профессор, Нидерландия5. Анисович А.Г.- ф.м.ф.д..профессор. Беларусия ФА6. Кодиров Т- к.ф.д., профессор ТКТИ7. Абдурахмонов Э– к.ф.д., профессор СамДУ8. Насимов А-к.ф.д., профессор СамДУ9. Сманова З.А.-к.ф.д., профессор ЎзМУ10. Мавлонов Х-б.ф.д.,проф ЖДПУ11. Қутлимурудова Н.Х-к.ф.д., доц. ЎзМУ12. Нуралиева Г.А.-доц.ЎзМУ13. Султонов М.М.-к.ф.д.,доц ЖДПУ14. Худанов У.О. – доц., ЖДПУ15. Муродов К.М.- доц. СамГУ16. Абдурахмонов Ғ- доц ЎзМУ17. Янгибоев А-ф.д.(кимё)(PhD), доц ЎзМУ18. Хакимов К –г.ф.н., доц. ЖДПУ19. Азимова Д-б.ф.н. ЖДПУ20. Гудалов М- доц ЖДПУ21. Орзикулов Б.- ф. д. (кимё)(PhD), ЎзМУ22. Хамраева Н-доц. ЖДПУ23. Рашидова К-доц ЖДПУ24. Мурадова Д- доц ЖДПУ25. Инатова М.С.-доц ЖДПУ
<p>Муассис-Жиззах давлат педагогика университети</p>	
<p>Журнал 4 марта чиқарилади (ҳар чоракда)</p>	
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**BIOECOLOGICAL, MEDICINAL PROPERTIES AND
AGROTECHNOLOGY OF GROWING ICELANDIC MOSS (CETRARIA)**

Absamatova Madina-bachelor

Ortiqova Mokhira-teacher,

Jizzakh state pedagogical university

Abstract. The scientific article discusses the botanical properties of the Icelandic moss *Cetrária islándica*, medicinal properties of the Icelandic moss (*ceptraria*), as well as their cultivation at home. The purpose is to determine the classification; botanical, chemical and medicinal properties and contraindications of Indian moss; their cultivation at home in Uzbekistan. The Latin name of the Icelandic moss is *Cetrária islándica*. *Cetrária islándica* grows naturally in many pine forests, heath forests, swamps, tundra and forest tundra. A useful feature is that it can be a raw material for the national economy. The article analyzes in detail the properties of Icelandic moss and their cultivation at home in Uzbekistan.

Keywords: botany, medicinal plant, lichen, *Cetrária islándica*

Аннотация. В научной статье рассматриваются ботанические свойства Исландского мха *Cetrária islándica*, лекарственные свойства исландского мха (цетрария), а также выращивание их в домашних условиях. Цель – определить классификацию; ботанические, химические и лечебные свойства и противопоказания Индийского мха; выращивание их в домашних условиях в Узбекистане. Латинское название Исландского мха *Cetrária islándica*. *Cetrária islándica* произрастает естественным образом во многих сосновых лесов, верещатников, болот, тундр и лесотундр. Полезная особенность заключается в том, что он может быть сырьем для народного хозяйства. В статье подробно проанализированы свойства Исландского мха и культивирование их в домашних условиях Узбекистана.

Ключевые слова: ботаника, лекарственное растение, лишайник, *Cetrária islándica*

Annotatsiya. Ilmiy maqolada Islandiya Moxi *Cetraria islandica* ning botanika xususiyatlari, Islandiya moxining dorivor xususiyatlari (*Cetraria*), shuningdek ularni uyda etishtirish ko'rib chiqiladi. Maqsad tasnifni aniqlash; Hind moxining botanika, kimyoviy va dorivor xususiyatlari va kontrendikatsiyasi; ularni O'zbekistonda uyda etishtirish. Islandiya moxining lotincha nomi *Cetrária islandica*. *Cetrária islandica* tabiiy ravishda ko'plab qarag'ay o'rmonlarida, botqoqlarda, botqoqlarda, tundralarda va o'rmon-tundralarda o'sadi. Foydali xususiyat shundaki, u milliy iqtisodiyot uchun xom ashyo bo'lishi mumkin. Maqolada Islandiya moxining xususiyatlari va ularni O'zbekistonning uyida etishtirish batafsil tahlil qilingan.

Kalit so'zlar: botanika, dorivor o'simlik, liken, Cetraria islandi.

Cetraaria islandica, or Islandic moss (Latin Cetrária islándica) is a species of lichen native to Europe, Asia, Africa and Australia.

Scientific classification:

Domain: Eukaryotes

Kingdom: Mushrooms

Department: Ascomycetes

Class: Lekanoromycetes

Order: Lekanorovye

Family: Parmelia

Genus: Cetraria

Type: Cetraria Icelandic

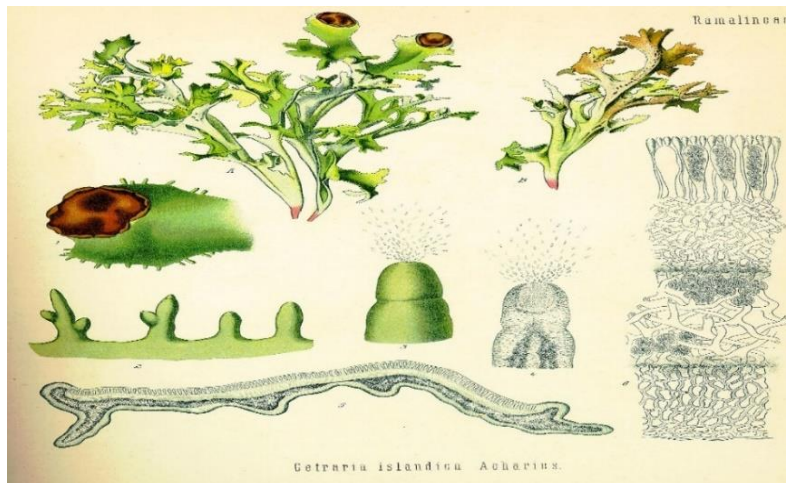
Botanical properties

Icelandic moss

Icelandic moss does not grow in poor environmental conditions, which helps to determine the state of the atmosphere and the presence of toxic substances in the soil. The medicinal properties of lichen were known in the Middle Ages. It is quite possible that living representatives from that era have come down to us, because Icelandic moss can live up to a thousand years. Until the 19th century, Icelandic moss was also widely used in medicine, both folk and official, but after a number of changes and progress in chemistry, humanity temporarily lost interest in the medicinal plant. In 1920, it was the Icelandic moss that saved many people in the far north from starvation. People added moss to food and consumed it as an independent product. Icelandic moss (*Cetraria Islandica*) grows not only in Scandinavia, but also in Europe, Asia, Africa and even Australia. Lichen grows in the tundra, on the slopes of mountains and in pine forests. It takes root well on rocky soil rich in peat, with a lot of sand and lighting. It often grows on trees and stumps. *Cetraria* is also a favorite treat of reindeer. Lichen reproduces by transplanting to favorable soil, but it grows very slowly. In Iceland, there are whole fields of this healing lichen, which can grow stronger every year.

Icelandic moss grows virtually everywhere it can reach - on rocks, slopes and faults. He can even cover a small pit with himself and substitute an unlucky traveler. Moss fields are best seen in the warm season, so keep this in mind if you decide to see the healing lichen with your own eyes. The plant is an epiphyte, which implies the absence of a root system. Lichen also needs a sufficient amount of light, which is why it often grows in the lowlands or in the highlands. Depending on the place of

growth, the cetraria changes its color and becomes covered with a kind of “tan” in areas with good light, becoming gray or even black. If the Icelandic moss has grown in the lowlands or it lacks heat, then the bush will be almost white.[1]



Botanical illustration from the book Köhler's Medizinal-Pflanzen, 1887.

A, B — plant; 1 — the blade of the stratum with a fruit body of the apothecium type; 2 — the edge of the stratum with cilia bearing pycnidia; 3 — a separate cilia with pycnidia scattering pycnoconidia; 4 — the same in longitudinal section; 5 — the blade of the stratum with an apothecium in a cross section; 6 — a section through the blade of the stratum and apothecium, at high magnification.

The lichen layer looks like loose turf up to 10-15 cm high. It is formed by flat, sometimes grooved-folded, blades. The lower surface is lighter colored, it is light brown, almost to white, with numerous white spots and bark breaks that serve for air penetration.[2]

The blades are irregular-ribbon-shaped, leathery-cartilaginous, narrow, flat, with short dark cilia. Depending on the lighting, the surface of these blades is brown or greenish-brown, shiny. The edges of the blades are slightly bent upwards.

Fruit bodies are formed at the ends of the expanded lobes. Saucer-shaped, brown in color, flat or slightly concave, 1.5 cm in diameter, with a slightly serrated edge.

Chemical Properties

Icelandic moss consists of algae and fungus, which live in mutual dependence on each other. Algae are engaged in photosynthesis, and fungi supply water and dissolve salts in the plant's body. Surprisingly, when performing diametrically opposite tasks, the fungus and algae work together for the common good. The composition of Icelandic moss includes proteins, fats, polysaccharides, carbohydrates (about 80%), acids, wax, gum, titanium, iodine, trace elements and starchy

substances. Lichenin accounts for more than half of the composition of all lichen carbohydrates.

It is this polysaccharide that, when mixed with water, creates a jelly mass. It is very nutritious, but practically not absorbed by the human body. However, it is perfectly suitable for deer, turning cetraria into an important part of the diet and a real treat for them. Many scientists use lichenin as a nutrient base for growing microorganisms and various bacteria. Lichen acids give the moss bitterness, increase the overall tone of the body and help fight pathogenic bacteria. Chitin acts as activated carbon and is a sorbent.^[3] This active ingredient is also useful in the fight against psoriasis and some other skin diseases. D-protolychesteric acid and usnic acid in a pair make lichen so valuable. Usnic acid is a natural antibiotic and is able to fight even Koch's bacillus, which causes tuberculosis in children and animals.

Fumaroprotocetraric acid, which is also part of cetraria, makes moss a natural antiseptic and promotes wound healing. Icelandic moss also has a small content of vitamin C and B. Silicon stimulates collagen synthesis and helps the skin look healthy. Cobalt in the composition of Icelandic moss activates the metabolism and metabolism of folic acid. Fluoride in the cetrarium helps not only in the treatment of stomatitis, but also participates in the construction of bones, which makes lichen very useful for teeth. Icelandic moss is rich in iron, which is necessary for the body to quickly deliver oxygen and prevent myocardiopathy.^[2]

In addition, lack of iron leads to fatigue. All these components make lichen a multifunctional and absolutely safe natural medicine. Polysaccharides, which are present in Icelandic moss, increase the overall resistance of the body and are immunostimulants. In addition to individual reactions to the body, lichen has no contraindications. However, when using drugs containing Icelandic moss, you need to consult a doctor or start with a small dose of medicine.

Medicinal properties and indications for use

Iceland moss contains 70% mucus, organic acids that have an antibacterial effect on the body. Due to the content of sodium carbonate in this plant, it is used as a remedy for tuberculosis bacillus. In addition, this plant contains enzymes, iodine, various vitamins and odorous substances. The plant has properties that increase immunity.

The mucous substances contained in this plant relieve inflammation in the mucous membranes of the pharynx, nose and mouth, stomach and intestines. Also, these slime have a soothing property. Icelandic moss is used for coughing and as a means used for rinsing the throat and mouth with inflammation of the tonsils.

Thanks to the bitterness of the plant, digestion improves and appetite increases. Whooping cough is another disease that can be cured with a tea mixture based on Icelandic moss.[4]

Icelandic moss has many useful and therapeutic properties: sedative; expectorant; antibacterial; increases appetite; antioxidant; antimicrobial; suppresses the growth of harmful fungi and pathogenic bacteria. Icelandic moss is recommended for diseases such as: acute inflammation of the gastrointestinal tract; food poisoning; gum inflammation, stomatitis and other oral diseases; endocrine diseases; diseases of the genitourinary system in men; tuberculosis, asthma, sore throat and bronchitis; burns, rash, acute dermatitis; chronic fatigue.

How to grow moss at home?

Growing moss in the house is not difficult at all, and caring for it will not require much effort. At home, you can grow cetraria (Icelandic moss), sphagnum, yagel, very picturesque brachythecium, velvet dicranum, leucobrium.



In addition to their medicinal properties, they can also be used as ornamental plants. These plants can be grown in the conditions of our region by creating amazing living compositions, miniature gardens and forest landscapes that will give the house an atmosphere of harmony and unity with nature.

The main thing is to provide mossy conditions for a comfortable existence.

You can grow bryophytes in any container, but they look most spectacular at the bottom of transparent aquariums or vases, in shallow bowls, clay plates and bowls.

To begin with, put a layer of small pebbles or expanded clay the size of a pea or slightly larger on the bottom of the selected container. This will improve water permeability and prevent moisture stagnation. Lay out the next layer of granulated coal. Then add the substrate. Then the most interesting thing begins - the creation of landscape design. The surface does not have to be flat[1]

You can make small mounds and depressions, add pieces of wood, pebbles, plant small moisture-loving plants and lichens, giving depth and sharpness to the composition, which will look like a real forest landscape.

How to care for moss at home?

In the first days after planting, the pads should be sprayed daily. After a short period of adaptation, the moss will begin to grow.

Excess moisture can be recognized by the color of the moss layer – if it has darkened, then reduce the frequency of spraying. The optimal hydration regime after adaptation is once every 3-5 days.

Moss fragments look beautiful on the surface of a tree or large stones. You can fix them with a thin fishing line and nylon thread or grow a moss layer yourself.

In conclusion, we can say that Icelandic moss is a lichen that is a symbiotic association of fungi and green algae. Despite the fact that Indian moss grows in the highlands or in favorable conditions, they can be grown at home. It is used as an expectorant and sedative; in gastrointestinal diseases; asthma, burns, rashes and other diseases.

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