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MEDICINAL PROPERTIES OF KUCHALA SEEDS - SEMINA STRYCHNI AND WATER LILY RHIZOME BELLADONNA LEAVES, ABOVE-GROUND PARTS.

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Abstract

This article extensively covers the biological properties, chemical composition and practical importance of kuchala seeds. Kuchala seeds contain biologically active substances, including alkaloids, oils and other organic compounds, which play an important role in the plant's defense mechanisms. During the study, the morphological structure of the seed, germination indicators and resistance to external factors were analyzed. At the same time, it was determined that due to the toxic properties of some of the substances in its composition, it is necessary to use it with caution. In medicine, it is used for metabolic disorders, when the eyes become blurry. Kuchala seeds expand the possibilities of studying and rationally using them on a scientific basis. The article extensively covers the properties of the medicinal plant.

Keywords

Alkaloids, strychnine, brucine, toxic substance

neurotoxin, pharmacological effect, central nervous system stimulation, convulsive effect, dose-dependent poisoning, antidote

Among the medicinal plants containing alkaloids belonging to the indole family, the seeds of the Strychnia semina Strychni.

Plant name.

Strychnos nux vomica L.; Loganiaceae - belongs to the Loganiaceae family. Strychnos is a tree up to 15 m tall. The leaves are simple, ovate, thick, shiny, hairless, arranged oppositely on the stem. The flowers are sessile, collected in a semi-umbrella. The calyx is five-toothed, the corolla is greenish-white, five-lobed, the male node is 5-lobed, the female node is two-lobed, located above. The fruit is a spherical, red-yellow, 2-8-seeded, wet fruit.

All parts of the plant are poisonous. The plant is mainly found in southern India, Sri Lanka, Indo-China and Indonesia, and in northern Australia. Kuchala can be grown in tropical countries. It does not grow in our country. The seeds are imported from foreign countries. The finished product consists of a flat, round, yellowish-gray seed, concave on one side and convex or flat on the other. The seed is 1.5 cm in diameter, 3-6 mm thick, and has many adherent hairs directed from the center to the edges, which is why it has a silky shine.

The seed has a navel in the center, which looks like a small bulge. The kuchala is very hard and softens after boiling in water for half an hour. Then it can be split in half with a lancet. Under the seed coat is a horn-like, whitish-gray, hard endosperm and an embryo up to 7 mm long. The seed coat is arranged one above the other. The product is odorless and has a bitter taste. According to the XI DF, the total ash content in the product should not exceed 3.5 percent.

The kuchala contains 2-3 percent alkaloids. The main alkaloid, strychnine, accounts for 44-55 percent of the total alkaloids, the rest is brucine (approximately the same amount as strychnine) and 0.1 percent of the alkaloids pseudostrychnine, vomitin, colubrin, and struxin. In addition to alkaloids, kuchala contains zaharsjz loganin glycoside, chlorogenic acid, cycloarsenol triterpenoid, and stigmasterone. The presence of strychnine and brucine alkaloids in the seed can be determined using the following reactions.0,5g of seed powder is placed in a flask, 10 ml of chloroform is added to it and shaken slightly. Then 1 ml of ammonia solution is added to the mixture, shaken for another 5 minutes and filtered into another flask. The filtrate is divided into two porcelain dishes and evaporated on a water bath. 0.2 ml of potassium dichromate solution is poured into the dry residue in the first dish and 0.2 ml of concentrated sulfuric acid is slowly added (from the edge of the dish) and shaken slightly, a red-violet color characteristic of strychnine is formed.

0.2 ml of concentrated nitric acid is added to the dry residue in the second dish, a red-orange (yellowish-red) color characteristic of brucine appears.

Use. Kuchala preparations have the property of stimulating the central nervous system. Of the Kuchala alkaloids, only strychnine is used in medicine.

Strychnine is used in intestinal ulcers, atony (loss of intestinal tone, chronic diarrhea), metabolic disorders, amblyopia (decreased vision with almost no changes in the eye), amaurosis (blindness and complete loss of vision in otherwise healthy eyes), and other diseases, as well as to stimulate appetite. It is sometimes used in cases of poisoning with strong drugs such as chloroform, alcohol, and other substances. Medicinal preparations. Strychnine nitrate is available in powder form and as a solution in ampoules; tincture and dry extract.

Water lily rhizome-rhizomata nupharis.

Plant name.Yellow water lily - Nupbar luteum (L.) ;

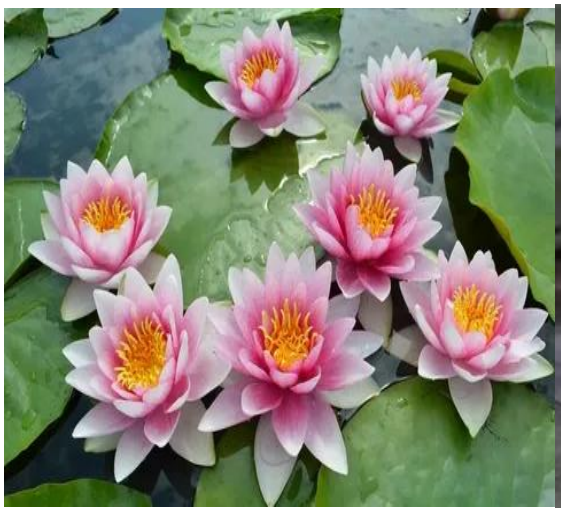
belongs to the family of nymphaea - Nympbaeaceae. A perennial, aquatic herb. The rhizome is thick, with many roots, reaching a length of 1-2 m. The underwater and floating leaves of the plant differ sharply from each other. The underwater leaf is translucent, thin, slightly curled, while the above-water leaf is thick, with long stripes, straight edges, elliptical in shape, with a deep heart-shaped base. Large, yellow, spherical, fragrant flowers

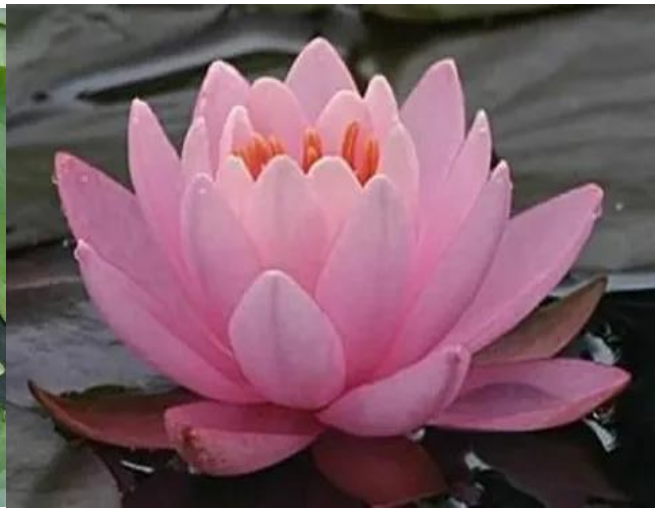
rise 5-6 cm above the water surface. The calyx is bell-shaped, large, with 5 sepals, yellow. The petals are numerous, thin, yellow, the male is also numerous, the female is not columnar. The

fruit is an inverted pear-shaped, berry-like fruit. The seed is surrounded by an air-retaining sac. Therefore, the seed does not sink to the bottom of the water. It blooms in June-September.

Found in Moldova, Ukraine, Belarus, the Baltic states, the European part of Russia, the Caucasus, Siberia and Central Asia. It grows mainly in slow-flowing waters, lakes. The product is collected mainly in the republics of Ukraine and Belarus,

in the Krasnodar Territory, the Voronezh Region and some districts of Russia.Product preparation. The rhizome is separated from the harvested plant and cut into pieces and dried in the open ground. The product is prepared during the flowering and fruiting period of the plant - from May to October.The finished product consists of cylindrical rhizome pieces.





The outside of the rhizome is greenish-yellow, and the inside is white, with the remains of a light brown flower arrow and leaf sheath.Chemical composition. The rhizome contains alkaloids (not less than 0.35%), a small amount of tannins, up to 44% starch, metarabinic acid, sucrose and other compounds. From the collection of alkaloids, furan ring α. and l3-nufaridines, which are included in the quinolizidine product, are also isolated, sulfur-containing and dimer products of nufaridine, thiobinufaridine, etc.

Use. Alkaloids of the water lily plant have protistiostatic and protistocidal effects, and its medicinal preparation is used in the treatment of acute and chronic trichomoniasis, as a means of preventing pregnancy.

Medicinal preparation. Lutenurin (a salt of the alkaloid complex with hydrochloric acid) is used in the form of a solution, liquid ointment, or balls and effervescent tablets.

Medicinal properties of belladonna leaves, aerial parts and rhizomes.

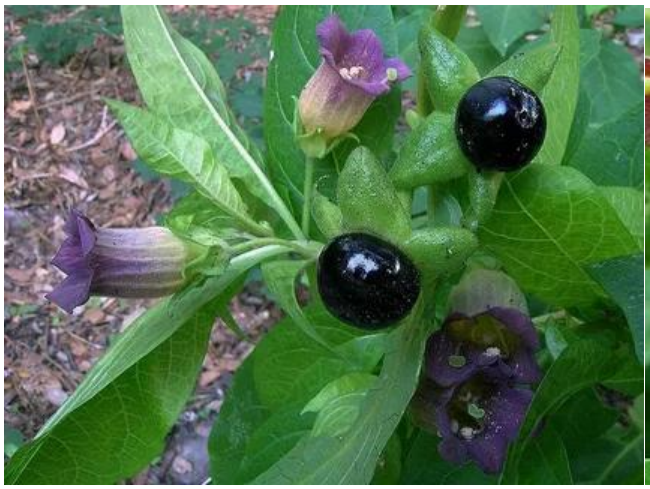
Name of the plant.Common (medicinal) belladonna - Atropa,belladonna L.; Caucasian belladonna - Atropa caucasica Kreyer; relatives - belongs to the Solanaceae family. Belladonna is a perennial plant, reaching a height of 2 m. The rhizome is multi-headed, and the root is thick and branched. The stem is erect, single, sometimes several, thick, green, the lower part is unbranched, and the upper part has 3 branches, which in turn give rise to a bunch of branches arranged alternately. The leaves are simple, dark green, arranged in pairs on the stem with a short petiole. One of these pairs of leaves is always larger. Large leaves are elliptical, and small ones are ovate.

The flowers grow singly or in pairs in the leaf axils.

located. The calyx is five-toothed, cylindrical-bell-shaped, remains with the fruit, the corolla is five-lobed, the tip is slightly curved back, painted purple, and the base is yellow-brown. The fruit is a purple-black, shiny, two-chambered, slightly flat, many-seeded. A sweet-sour, delicious, juicy fruit. The seeds are kidney-shaped, brown, with pits on the upper side. It blooms in June-July. All parts of the plant are poisonous.

Geographic distribution. Both plants grow in forests and roadsides, along watercourses, and in meadows at an altitude of 200-1000 m. Caucasian belladonna is found in Transcaucasia, the North Caucasus, and the Krasnodar Territory, while medicinal belladonna is found in the Carpathians, Western Ukraine, in the mountainous and forested regions of Crimea, and in the Republics of Moldova. Currently, belladonna is cultivated in the Krasnodar Territory, Crimea, and in the Poltava and Voronezh regions.

Product preparation. The leaves of a wild plant are harvested by hand twice during the summer. The leaves of those grown on plantations are harvested 3-4 times throughout the summer. As soon as the plant blooms, the leaves on the lower part of the stem are harvested, and at the end of flowering, the leaves on new branches. After the seeds are formed, the above-ground part of the plant is cut to a length of 10 cm. If the plant produces new branches after harvesting, the leaves on them are also harvested 1-2 times. The harvested product is cut to a length of 4 cm and then dried. Belladonna on plantations is grown for 5-6 years. After the last above-ground part is harvested, the roots are dug up, washed, cleaned of soil and cut to a length of 10-20 cm.




The root of the plant is dried in the open ground, and the leaves and the above-ground part in dryers. If the leaves are dried in the open air for a long time, the alkaloids may decompose. The cut above-ground part and the root are sent to factories for the preparation of galenic preparations and the extraction of atropine alkaloid from the root. The finished product consists of the leaves of the plant, the above-ground part and the root. The leaves of belladonna are simple, elliptical and ovate, with a sharp tip, smooth edges, green or brown-green in color, with short stripes, thin, hairless, brittle, up to 25 cm long and 13 cm wide. The product is odorless and has a bitter-pungent taste. According to the XI DF, the leaf moisture content should not exceed 13 percent, total ash 15 percent, ash insoluble in 10 percent hydrochloric acid 3 percent, blackened and browned leaves 4 percent, the upper part of the belladonna stem and some fruits or flowers should not exceed 4 percent, organic impurities 0.5 percent and mineral impurities 0.5 percent. The whole product should contain: 4 percent of the fine part passing through a sieve

with a hole diameter of 3 mm, 8 percent of the cut product should contain 7 mm of fine parts, and 10 percent of the part passing through a sieve with a hole diameter of 0.5 mm. Since the leaf is hygroscopic, it should be stored in dry rooms and in closed containers.

The above-ground part of the plant consists of a mixture of cut stems, leaves and flowers. The upper side of the stem is light green, with a whitish inner layer, a porous core, and is 4 cm long and 1.5 cm thick. The moisture content of the above-ground part is 13 percent, the leaves are 45 percent, including 4 percent of yellowed, brown and blackened leaves on both sides, 1 percent of organic impurities and more than 1 percent of mineral impurities, and the total amount of alkaloids (calculated as hyoscyamine) should not be less than 0.35 percent. The root is uncut (cylindrical) or cut lengthwise, the upper side is gray-brown, twisted, and the inner side is gray-yellowish, white-yellowish, and is 20 cm long and 0.6-2 cm thick. The root is odorless, bitter, and has a pungent taste. Root moisture should be 13 percent, total ash 6 percent, 10 percent hydrochloric acid insoluble matter 2 percent, dark roots 3 percent, woody roots 3 percent, organic impurities 0.5 percent, mineral impurities 1 percent, and root parts less than 1 cm long should not exceed 3 percent. For the cut product, the parts larger than 7 mm should be 10 percent, the part that passes through a sieve with a hole diameter of 1 mm should be 10 percent, and mineral impurities should not exceed 0.5 percent. Chemical composition. All parts of the plant contain alkaloids. According to XI OF, the total content of alkaloids in leaves should not be less than 0.3 percent, and the total content of alkaloids in roots should not be less than 0.5 percent. In addition to alkaloids, the product contains small amounts of volatile bases: N-methylpyrroline, N-methylpyrrolidine and pyridine, and the root also contains cushygrin. Atropine, hyoscyamine, scopolamine (hyoscine), apoatropine (atropamine) and belladonnine are the asocial alkaloids of belladonna. Belladonna alkaloids belong to the tropane group, they are structured as complex esters. Tropan is a bicyclic compound formed by the union of pyrrolidine and piperidine through nitrogen, and when its alcohol - tropanol - combines with tropic acid, a complex ester - atropine alkaloid is formed.

Use. Belladonna preparations are used as antispasmodics in various spasmodic conditions (intestinal and urinary tract spasms), as well as as painkillers in gastric and duodenal ulcers, cholecystitis, gallstones, renal colic, as well as in the treatment of bronchial asthma and to reduce the fluid secreted by the salivary and mucous glands. In addition, it is also used to dilate the pupils in eye diseases. The root preparation is given to treat Parkinson's disease. Of the alkaloids of the belladonna plant, atropine and scopolamine are used in medicine, hyoscyamine is not used because it is more toxic.

Medicinal preparations. The salt of the atropine alkaloid - atropine sulfate, a thick and dry extract, tincture are prepared from the leaves and aboveground part. A decoction of the root prepared in wine. The leaves are part of a powder used against asthma. In addition, extracts prepared from belladonna leaves and roots are included in the form of "korabella" tablets, solutan, becarbon, besalol, bellalgin, bellastezin, bepasal, tablets used for stomach diseases, "betiol" suppositories, "anuzol" suppositories, and the composition of plant alkaloids is included in complex preparations such as bellataminal, akliman, lenbiren.

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