APIACEAE LINDL IN FLORA OF NAKHCHIVAN AUTONOMOUS REPUBLIC: POISONOUS SPECIES OF THE CELERY FAMILY

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Abstract: This article delves into the unique and abundant vegetation in the Nakhchivan region, which is a part of ancient Azerbaijan. The region's climate is markedly continental, characterized by ample solar radiation and moisture abundance, alongside low plant humidity containing biologically active substances. These factors have had a positive impact on the quantity of such substances in the plants. Notably, the Nakhchivan Autonomous Republic stands out from other regions of Azerbaijan in terms of the percentage of chemical compounds within the diverse composition of its flora. Plants that possess these unique properties have extensive applications in the field of medicine. However, it's important to acknowledge that in some instances, plants with chemical compounds can be toxic to both humans and animals that consume them, occasionally resulting in fatal consequences.
During the course of the research, it was observed that species from the *Apiaceae Lindl*. family were not present in the Nakhichevan region. Furthermore, 12 species belonging to 9 chapters of the urban associations were identified. These chemical compounds have applications in the field of medicine.
Keywords: *Apiaceae Lindl*., Astrantia., poisonous plants, alkaloids, glycosides

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Introduction:

Ancient Azerbaijan, as well as the climatic conditions of the Nakhchivan region, boasts a remarkably diverse vegetation when compared to other regions within the republic. The unique composition of vegetation in the Nakhchivan Autonomous Republic sets it apart from other regions of Azerbaijan. However, the presence of certain chemical compounds in specific plants can pose risks to both humans and animals that consume them, occasionally resulting in fatal consequences. These toxic compounds encompass a range of substances, including alkaloids, glycosides, saponins, various acids, lactones, dyes, essential oils, and mucilage, among others. The region's sharply continental climate, marked by intense solar radiation and moderate moisture levels, influences the presence and concentration of these compounds within the plant species. Consequently, the flora of the Nakhchivan Autonomous Republic is distinguished by its distinctive composition, patterns of species distribution, origins, and other specific attributes. Many of these plants, known for their chemical properties, find extensive use in the field of medicine.

Materials and methods:

A comprehensive study conducted in the Nakhchivan Autonomous Republic identified a total of 3,021 plant species, classified into 8 classes, 104 orders, 176 families, and 908 genera. Within this extensive floral diversity, it was found that 302 plant species belonging to 6 classes, 49 families, and 109 genera are characterized as poisonous. The research also focused on the examination of the Apiaceae Lindl family, specifically exploring the urban settlements of this species and its bioecological characteristics, as well as patterns of distribution based on elevation.

Within the global flora, flowering plants represent a highly prevalent and economically significant group, comprising a wide array of genera and over 3000 known varieties. In Azerbaijan's flora, there are 75 genera and 184 species, and within the Nakhchivan Autonomous Republic's flora, there are 57 genera and 107 species. Throughout this research, compounds with medicinal applications were identified in 12 species belonging to 9 genera within the Nakhchivan region (Ibadullayeva, 2005); (Ibadullayeva, 2004).

Between 1998 and 2005, S. Ibadullayeva conducted extensive and thorough research on celery, delving into its distribution within the Azerbaijani flora, natural resources, systematics, biomorphological characteristics, ecological properties, and practical applications (include references to these studies as needed).

Result and discussion:

Celery-like plants belonging to the family of perennial, biennial, or annual herbs, the flowers of which are complex, in some cases annual. There are covering leaves at the base of the stem. The flower is actinomorphic, or the outsider is isomorphic. They are usually same-sex. Sepals are tuberous or truncated. Petals 5, stamens 5, ovary lower, two-lobed. In each nest there is an interdependent seed. Its column consists of two and also nine and nine, connecting with each other, forming a ring. The fruit is a two-nest box, two-part. Each of the 3 sides of the seed is smooth, the back is ribbed, there are depressions between the ribs. Most often, second ribs are formed in these depressions. Sometimes there are incisions on the fruits. The endosperm is not smooth, curved or striped. The leaves are petiolate, multi-layered, or multi-layered. There are no sublayers. The stem in the form of an expanded trunk wraps around. Their stems are hollow, and there are also caterpillar passages. This season, among the plants to which it belongs, is extremely useful, especially the water, essential oil and also the preparations are its plants.

Astrantia L. - A genus of yeast corals, out of 10-13 species distributed in Asia Minor, Central and Southern Europe, there are 5 species in the Caucasus, 2 in Azerbaijan. In the Nakhchivan Autonomous Republic, only *Astrantia Maxima* Pall. - A type of large atrial fibrillation is listed in the Red Book of the Nakhchivan Autonomous Republic[6, pp.487-489].

*Astrantia maxim*a Pall.- The large size of corals and the small number of their populations, ecological, zoogenic and anthropogenic factors due to their limiting effect on risk - LR [c-Least Concern-LC]status is listed in the Red Book of the MR (Talibov, 2010) It is distributed in small numbers in the Batabatmesh of the Shahbuz district, on mesophilic meadows in the foothills of the Kukudag, in the foothills of the Julfa district and in the Tillyakmesh of the Ordubad district.

It is considered a poisonous plant because of the alkaloids contained in it. This is a perennial plant, reaching a height of 70 cm. the umbrella is located at the end of the stem. The lower stem leaves are long-stemmed, 3 (4) are separate, scalpel, the lateral ones are wider, toothed-ciliated along the edges, the middle and upper stem leaves are sessile, and the lower stem leaves are stem-embracing, three-partitioned or three-partitioned. The umbrella is 3.5-4 cm in diameter, rigidly ciliated at the edges, greenish on the outside, pink inside. The flowers are numerous, narrow scalpel. The calyx is toothed, with a narrow wedge-shaped base, 1.5 mm long. The fruit is up to 10 mm long, multicellular. Blooms in June-July, seeds ripen in July-August. Honey-bearing, ornamental and medicinal plant. This is a mesophyte. It is included in the Lesser Caucasus geographical area. During flowering, the large Tremor contains alkaloids in all sense organs. When drying, the number of alkaloids decreases significantly. According to many fiber authors, the root of yeast cranberry has a laxative property, because of the unpleasant smell, it is not eaten by animals on pastures and is considered a poisonous plant of pastures.

Chaerophyllum L. -Of the 7 species of the genus Cacix found in Azerbaijan, 2 are considered poisonous plants of pastures. And in the flora of naxcivan Mr one of 4 species, *Chaerophyllum Aureum* L. (Gl. maculatum Wild. ex DC.)- The golden cacix is poisonous. Cacix Golden is a herbaceous and poisonous plant 25-50 cm high with a potato-like tuber underground. The leaves have the shape of a stem arrow and are dark green in color. The flowers are arranged on a stem in the form of an inflorescence and are unisexual. There

are female flowers on the underside of this corolla, and male flowers on the upper side, and unproductive flowers in the form of hairs between them. The top of this bush is fleshy and convex, with a yellow leaf in the shape of a hat. Since this succulent plant is pollinated by insects, its flowers have attractive beautiful colors and exude a sharp unpleasant smell. Its fruits were red and orange in color and the size of blue peas, ripen in autumn. People use fresh leaves and roots. When the plant becomes poisonous in fresh form, dried and boiled, the toxic substances lose their effect. It contains starch, saponin and the alkaloid thymine. Eating a fresh plant can cause nausea, vomiting, diarrhea and poisoning, characterized by cardiac arrhythmias that can even lead to death. The literature indicates the presence of an insufficiently studied kerophyll alkaloid in cacix and poisoning of horses, pigs, pigs (Guliyev &ets, 1961).

Conium maculatum L. -Spotted celery of star anise-*Apiaceae* Lindl. chapters, star anise-Conium L. it includes the floor. The genus has 4 species distributed in Europe, Siberia and Asia Minor, one species is found in the Caucasus, in Azerbaijan, as well as in the Nakhchivan Autonomous Republic. It is widespread on forest edges, meadows, limestone meadows, plantings, in residential areas, along roadsides.

Conium maculatum L. -Spotted badyanin is a poisonous plant with an unpleasant odor, blooming from May to early July. The leaves are very similar to parsley. Sometimes it can reach two meters in height. The flowers are small and white. Basically, he can live on the roadsides, among bushes and ruins, on the edges of fields and even in garbage. Despite the venom, the appearance of the bucket is not terrible at all. There are reddish spots on the trunk. The chopped leaves of the plant resemble rosehip leaves. If it is crushed by hand, it will smell very bad. Even all parts of the plant, namely the root, stem, leaves and even seeds, are poisonous (Dudar, 1970). In ancient Greece, mortals were sentenced to death, as a great mercy, by drinking the poison of star anise, which killed a person without causing him suffering. Socrates committed suicide with poison derived from this plant, after his famous speech in defense of himself. In addition to the severe and sometimes fatal effects observed in animal experiments, such as brain disorders in puppies, it has been established that Badyan poison can have serious consequences. Cases of poisoning can lead to death within a mere 2-3 hours. To be lethal, Badyan poison must be transformed into a darker, liquid form, and this poisonous substance is used in pharmaceuticals. Remarkably, just 0.5 to 1 gram of the substance coniine, which is present in Badyan, is sufficient to kill an adult. It can also induce respiratory paralysis.

Badyan is a tall plant with stems reaching heights of 60-180 cm. These stems are branching, finely furrowed, and hollow. The leaves are smooth, with the lower part appearing reddish-brown. In the first year, leaves emerge around the root, while in the second year, the stem develops. The lower leaves are three-lobed, wide-triangular, measuring 30-60 cm in length, and they lack a stalk. They are oblong-ovoid, pinnately dissected, and occasionally have white tips. The middle and upper leaves are smaller and complex, consisting of narrow, stalkless sheaths. The terminal leaves are oblong, scalpel-shaped, or appear split.

The plant produces small white flowers, each with five petals. These flowers are clustered into numerous, shield-shaped clusters, forming a bouquet. The leaves are scalpel-shaped and narrow, with indistinct teeth along the edges, typically numbering between 3 and 7, and they are smooth with a distinctive background. The fruit is rounded and ovoid, measuring 3-3.5 mm in length. The twisted column's length can extend up to 1 mm. The roots are whitish in appearance. Badyan typically flowers in June and July, with fruit ripening occurring in August and September.

Various parts of the Badyan plant, including the stems, leaves, and flowers, are utilized for medicinal purposes. Leaves are harvested at the base, and immature seeds are collected along with the planted area. It's important to note that Badyan is a poisonous plant, containing the alkaloid coniine, along with methylconiine, conhydrin, pseudoconhydrin, and conimein substances. Additionally, seeds contain about 2% fatty oils, leaves contain 0.1%, flowers contain up to 0.24%, and fruits contain 2% alkaloids. It also contains quercetin, kaempferol, 0.08% essential oil, and alcoholic acid.

From a chemical and biological perspective, Badyan's alkaloid content classifies it among plant alkaloids. Alkaloids are intricate nitroge-

nous organic compounds derived from plants, often found in alkaline form and capable of reacting with acids. The term "alkaloids" is rooted in the Arabic word "alkali," meaning basic or alkaline, combined with the Greek word "eidos," signifying similarity. Essentially, "alkaloids" conveys the idea of compounds with alkaline properties. Oxygen-containing alkaloids are typically crystalline or amorphous substances, commonly colorless, odorless, and with a bitter taste. In contrast, nitrogen-containing alkaloids are usually volatile liquids in their pure form, known for their unpleasant properties and inherent toxicity. This group of alkaloids is included in species within various plant families, including Aconitum maculatum, Nicotiana tabacum (tobacco), *Nicotiana rustica* (wild tobacco), *Anabasis aphylla* (leafless female), and others. Alkaloids that are derivatives of piperidine and pyridine are present in multiple Badyan varieties, including spotted Badyan and obeliainflata. These alkaloids have a benzene core containing N and NH, which can stimulate the respiratory center, and they are used to regulate breathing in specific medical situations.

Badyan is employed for various medicinal purposes, serving as a diuretic, sedative, anti-inflammatory agent, analgesic, and anticonvulsant for conditions such as chorea, epilepsy, diphtheria, and migraine. This plant has been effectively employed to address various health issues, including acute respiratory infections, muscle spasms, anuria, anemia, dysmenorrhea, and syphilis. The treatment has yielded positive results. The leaves are used to combat rheumatism and serve as a hemostatic agent, while the fruits are used to address conditions such as epilepsy, cardiovascular diseases, and skin cancer.

Now, let's delve into the details of another plant, Dorema D. Don, which includes only one species in the genus Dorema: *Dorema glabrum* Fisch. & C.A. Mey. This particular species is considered endangered and has been listed in the Red Book of the Nakhchivan Autonomous Republic due to its decreasing population dynamics and the threat of extinction. It is primarily found in the Validagh, Dahnadag, Duzdag, and Darashamvadaridag regions of Azerbaijan, with the majority of collected materials coming from areas near salt deposits.

Dorema is a perennial plant with a stem covered in fibrous sheaths at the base. The stem can reach heights of 2-3 meters and is cylindrical in shape. Its leaves are leafy and typically triangular-ovate, displaying a feathery appearance. These leaves consist of segments that are 6-smoothie, oblong-scalar-shaped, and serrated. The umbrella of this plant is hollow, simple, and typically contains 8-12 flowers. The flowers themselves have petals that are up to one centimeter long, with 1-2 or 3-4 flowers per long branch in the flower group. The petals are glabrous and exhibit a whitish-yellow color. The fruit measures 5-8 mm in length and is elliptical, smooth, and multi-ridged. It contains ISAP-shaped ribs and ducts occurring singly or in pairs. The column is curved outward, and the plant emits an unpleasant strong odor. It blooms in June and July, with seed ripening taking place in July and August. This plant is valued for its essential oil and is categorized as a xerophyte. While Dorema is part of the Atropatan geographical area, it's important to note that the plant is toxic to foragers, and there are reports of early spring grazing animals, such as sheep, goats, and cattle, being affected.

Now, let's move on to Ferula, a genus with 6 species in the Caucasus and 4 species in Azerbaijan, including the Nakhchivan Autonomous Republic. One of its species, Ferula oopoda (Boiss. & Buhse) Boiss., is in critical condition and has been listed as critically endangered in the Red Book of the gardener MR. While it is found in a small area on the southern slope of salt, it is the sole representative in the territory of Nakhchivan MR. Materials collected from Duzdag were described in relation to this plant. Ferula oopoda is a tall perennial herbaceous plant with a compact root, growing up to one meter in height. Its stem is straight, solid, and cylindrical with a 1.5 cm diameter. The old leaves, which have deteriorated, are covered with fibrous sheaths. The leaves around the root are long-stemmed and wide, with a rhombus-shaped appearance. The initial segments are 3-4 sparse-shaped sections, measuring 2-5 cm by 1.5-2 cm. The central part is leafy and has 13-22 rays, with typically 2 long-petioled side umbrellas. The umbrellas contain 10-15 flowers, and the petals are up to 1.5 mm long, pale yellow in color, ellipsoid, pointed, and inlaid at the tip. The fruits are elliptical, up to 10 mm in length,

flattened, with edges measuring one mm in width. The ribs are prominent, the canals are undifferentiated and narrow. Ferula oopoda blooms in May-June, with fruits ripening in June-July.

The geographical region in which this plant is found is influenced by anthropogenic factors, particularly the presence of a television transmitter station, leading to a critical environmental situation resulting from the discharge of certain materials (Dzhafarov, 1985). This plant is known for its essential oil and color. The plant contains various compounds, including tannins, resins, starch, alkaloids, saponin, and essential oils. It is recognized for its aphrodisiac properties and is employed in the treatment of sexual disorders.

Let's explore some fascinating details about different plant species.

Heracleum L. - This genus is home to around 70 species commonly found in temperate zones spanning Europe, Asia, America, India, and the Himalayas. In the Caucasus, there are 25 species, with 7-8 species found in Azerbaijan, and 5 species in the Nakhchivan Autonomous Republic. One particular species, *Heracleum albovii* Manden, is especially sensitive and limited in its distribution, earning a vulnerable status listed in the Red Book of the gardener MR. This plant thrives in the middle and upper mountain regions in the Army District of the Nakhichevan AR, as well as in cold mountain, Yaglydere, Agyurdandurmus, and the ash-pebble, rocky, and grassy sand dunes.

Heracleum albovii Manden is known to induce skin photodermatitis upon contact with sunlight, resulting in 2-3 degrees of burns on the skin. Preventive measures include covering the affected area with a black cloth and thoroughly dousing it with water. This perennial plant's stem typically reaches heights of 40-50 cm, and its leaves have an ovoid, double-feathery appearance with dense, short gray soft-feathering on both sides. The plant has white-yellowish petals, and its elliptical fruit measures 6-7 mm in length. It blooms from June to August and reproduces via seeds. It's valued for its essential oil and is categorized as a mesoxerophyte. It falls within the Atropatan geographical area.

Prangos Lindl. - The Prangos genus boasts 5 species in Azerbaijan and 4 species in Nakhchivan. Among these, *Prangos ferulacea* (L.) Lindl. (also known as *P. biebersteinii* Karjag.), commonly referred to as "Ordinary chashir," is a poisonous perennial plant that can reach a height of 150 cm. It has a dense, tall, and branched trunk, along with striking yellow flowers, albeit with a sharp and somewhat unpleasant odor. Its oblong leaves measure 40 cm in length and have a multi-feathered structure. The plant's umbrellas have 6-16 rays, and its petals are greenish-yellow. Its ovoid fruit ranges from 15-20 mm in length. *Prangos ferulacea* blooms in May-June and yields fruits in June-August. It grows on dry and stony slopes of upper mountain areas but gives off an unpleasant odor, deterring herbivores from consuming it. In fact, it's known to cause blindness in horses, making it detrimental in pastures as it overshadows forage crops and diminishes their value.

Smyrniopsis L. - In the Smyrniopsis genus, there are 4 species, and one of them, Smyrniopsis aucheri Boiss., grows in areas with excess moisture, such as rivers, lake surroundings, fertile fields, and stony-rocky thickets in the Caucasus, Azerbaijan, and the Nakhchivan AR. This species, commonly referred to as "Oseleləklivəsiazəcək" in Nakhchivan, is a perennial plant with a height exceeding 120-150 (250) cm. It features a wobbly trunk and opposite or whorled branches. The stem and lower stem leaves are large with a double-section, ovoid appearance, and densely stemmed initial parts. Upper leaves are larger and less partitioned. The umbrellas have 12-15 rays and consist of 5-6 scalar or scalar-linear leaves, with each dressing comprising 1-3 small leaves. The flowers are yellow and dioecious, featuring a long, crafted tooth, and the fruit is ovoid-shaped and about 6-7 mm long. This plant blooms in June and produces seeds in July.

Kumarin liandefiris, known for its essential oil, is a mesophyte plant. Its geographical distribution extends to Iran.

This species is typically found in the mid-mountain belt near dry rivers. Although it has historically been concentrated in specific areas of the Shahbuz Rayon mountains, it has begun to extend to broader regions. One of the key factors contributing to this expansion is its resilience to cattle grazing due to the intensive seed production. Local populations are actively fighting against this invasive species. It can be

observed growing along valleys, reaching elevations of up to 2,800 meters in the Kukudag region.

In recent times, Kumarinliandefiris has also started to spread to other areas of the Nakhchivan Autonomous Republic, particularly in the north-western part of Kukudag at elevations ranging from 2,000 to 2,300 meters. This expansion has raised concerns, leading to its inclusion in the "green sheet" of the Red Book of the Nakhchivan Autonomous Republic.

Conclusion:

The research conducted in the Nakhchivan Autonomous Republic has revealed the presence of various species from the Apiaceae Lindl. family, with nine genera identified, including 12 species. Some of these species contain toxic compounds and have diverse applications in medicine. The richness and high biological activity of these genera, along with their abundance in the region, offer significant potential for various uses.

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