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BOTANICAL DESCRIPTION AND BIOECOLOGICAL FEATURES OF SOME SPECIES OF THE FAMILY Cyperaceae Juss. SPREADING IN THE NAKHCHIVAN AUTONOMOUS REPUBLIC TERRITORY

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БОТАНИЧЕСКОЕ ОПИСАНИЕ И БИОЭКОЛОГИЧЕСКИЕ ОСОБЕННОСТИ НЕКОТОРЫХ ВИДОВ СЕМЕЙСТВА Cyperaceae Juss., РАСПРОСТРАНЕННЫХ НА ТЕРРИТОРИИ НАХЧЫВАНСКОЙ АВТОНОМНОЙ РЕСПУБЛИКИ

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Abstract. The presented article provides information on the botanical and bioecological characteristics of some species belonging to the Cyperaceae Juss., nom. cons. family, spreading in Nakhchivan Autonomous Republic territory. The studies were carried out based on generally accepted geobotanical methods from September 2024 and had a precise route and semi-stationary character. Floristic and methodological expeditions were carried out in the ecological areas of the Araz-river banks, as well as in the high and middle mountainous areas of the Sadarak, Sharur, Kangarli, Shahbuz, Julfa and Ordabad administrative districts of the Nakhchivan Autonomous Republic, where the species of the family are widespread. The systematic composition of the family is given. The systematic composition of the family and description of the most common species are provided.

Аннотация. Приводятся сведения о ботанических и биоэкологических особенностях некоторых видов семейства Cyperaceae Juss., nom. cons., распространенных на территории Нахчыванской Автономной Республики. Исследования проводились на основе общепринятых геоботанических методов с сентября 2024 года и носили точный маршрутный и полустационарный характер. Флористические и методические экспедиции проводились в экологических зонах побережий реки Араз, а также в высокогорных и среднегорных районах Садаракского, Шарурского, Кенгерлинского, Шахбузского, Джульфинского и Ордабадского административных районов Нахчыванской Автономной Республики, где виды семейства широко распространены. Приводится систематический состав семейства и описание наиболее распространенных видов.

Keywords: flora, population, bioecology, sedges. Azerbaijan.

Ключевые слова: флора, популяция, биоэкология, осоковые. Азербайджан.

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Species of the *Cyperaceae* Juss.nom.cons. family are widely spread in the territories of the Nakhchivan Autonomous Republic. It can be said that the lakes covering a large area of the Batabat plateau are the main spreading areas of plants of this family.

Considering that the plants of the *Cyperaceae* Juss.nom.cons. family are mainly wetland plants, we have studied the botanical description and bioecological characteristics of the species.

Cyperaceae – belongs to the *Monocots* class. Plants of this family are generally found in water bodies and meadows. The species included in the family are also known for their various species that can grow on widely irrigated lands. *Cyperaceae Juss.nom.cons.* usually grow in swampy and moist soils. They can also be found near water bodies, in meadows and sometimes in steppes.

The genus *Cyperaceae* was first included in the botanical nomenclature by Jussieu in 1789.

Plants of the *Cyperaceae* family are generally known for their flat and elongated leaves. The leaves often have a parallel vein structure. Their flowers are simple and small, usually appearing in groups of many flowers.

Plants of the *Cyperaceae* family tend to grow in areas with variable water levels or in marshes. Due to their high water requirements, these plants also play an important role in the protection of ecosystems.

Some species, especially those of the genus *Carex*, can be used for medicinal and food purposes. In addition, some members of this family help stabilize the soil and regulate water in natural areas. The seeds and rhizomes of species of the *Cyperaceae* family are used for medicinal purposes, and can also be grown for ornamental purposes.

Material and methodology of the research

The research was conducted taking into account that the Nakhchivan Autonomous Republic covers large areas of lakes and wetlands in both the high mountainous and Araz-river areas.

The species of the *Cyperaceae* family included in the flora of the Nakhchivan Autonomous Republic have been studied from time to time by A. A. Grosheim [3], L. I. Prilipko [5], I. I. Garyagin [4], V. C. Hajiyev. Y. M. Isayev, R. A. Aliyev, A. I. Mayilov, M. P. Bogdanov [1, 2], etc.

Although individual scientists have provided information about the plants of this family, the species spreading in the Autonomous Republic territory have not been studied separately.

Classical botanical, floristic, systematic, archaeological, ecological and statistical methods were also used in the processing of the materials [6, 7].

Phenological observations were carried out based on I. N. Beideman [8].

The studies were carried out based on generally accepted geobotanical methods from September 2024 and had a precise route and semi-stationary character. Floristic and methodological expeditions were carried out in the ecological areas of the Araz-river banks, as well as in the high and middle mountainous areas of the Sadarak, Sharur, Kangarli, Shahbuz, Julfa and Ordabad administrative districts of the Nakhchivan Autonomous Republic, where the species of the family are widespread.

Discussion and results of the research

The classification of the family *Cyperaceae* Juss.nom.cons. is as follows:

Familia: Cyperaceae Juss., nom. cons.

Subfam. 1. Cyperoideae Suess.

1. Genus: *Bolboschoenus* (Aschers.) Palla

Sect. 1. *Browningia* Tatanov

Subsect. 1. Glauci Tatanov

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1(1) *Bolboschoenus glaucus* (Lam.) S.G. Sm.
Sect. 2. *Bolboschoenus*
Subsect. 2. *Bolboschoenus*
2(2) *B. maritimus* (L.) Palla.
2. Genus: *Schoenoplectus* (Reichenb.) Pala.
3(1) *Schoenoplectus tabernaemontani* (C.C.Gmel.) Palla
3. Genus: *Scirpoides* Seguier
4(1) *Scirpoides holoschoenus* (L.) Sojak
4. Genus: *Isolepis* R.Br.
5(1) *İsolepis setacea* (L.) R.Br (*Scirpus setaceus* L.)
5. Genus: *Blysmus* Panz. ex Schult.
6(1) *Blysmus compressus* (L.) Panz. ex Link.
6. Genus: *Eleocharis* R. Br.
Subgen. 1. Zinserlingia Egor.
7(1) *Eleocharis quinqueflora* (Hartm.) O. Schwarz (*E. meridionalis* Zinserl)
Subgen.2. Eleocharis
8(2) *E. austriaca* Hayek
9(3) *E. palustris* (L.) Roem. & Schult.
10(4) *E. uniglumis* (Link) Schult.
7. Genus: *Fimbristylis* Vahl
11(1) *Fimbristylis bisumbellata* (Forssk.) Bub. (*F. dichotoma* (L.) Vahl)
8. Genus: *Cyperus* L.
Subgen. 1. Cyperus
Sect.1. Rotundi C.B. Clarke
12(1) *Cyperus longus* L.
13(2) *C. rotundus* L.
Sect.2. Compressi Nees
14(3) *C. glaber* L.
Sect.3. Fusci (Kunth) C.B. Clarke
15(4) *C. difformis* L.
16(5) *C. fuscus* L.
Subgen. 2. Micheliani (C.B. Clarke) Kukkonen
17(6) *C. michelianus* (L.) Delile
9. Genus: *Pycreus* P. Beauv.
18(1) *Pycreus flavidus* (Retz.) T. Koyama
10. Genus: *Torulinium* Desv. ex Hamilt.
19(1) *Torulinium caucasicum* Palla
Subfam. 2. Rhynchosporoideae Aschers. & Graebn.
11. Genus: *Schoenus* L.
20(1) *Schoenus nigricans* L.
Subfam. 3. Caricoideae Pax
12. Genus: *Kobresia* Willd
21(1) *Kobresia schonoides* (C.A.Mey.) Steud Kobreziya
22(2) *K. macrolepis* Meinsh.
13. Genus: *Carex* L.
Subgen. 1. Carex
Sect. 1. Aulocystis Dumort.

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23(1) *Carex tristis* Bieb.

Sect. 2. Vesicariae Meinsh.

24(2) *C. vesicaria* L.

Sect. 3. Paludosae G. Don

25(3) *C. acutiformis* Ehrh.

Sect. 4. Tumidae Meinsh.

26(4) *C. riparia* Curt.

27(5) *C. melanostachya* Bieb. ex Willd.

Sect. 5. Secalinae (O.Lang) Kük.

28(6) *C. hordeistichos* Vill.

Sect. 6. Paniceae (Carey) Christ

29(7) *C. panicea* L.

Sect. 7. Mitratae Kük.

30(8) *C. huetiana* Boiss.

31(9) *C. caryophyllea* Latourr.

Sect. 8. Spirostachyae (Drej.) L.H.Bailey

32(10) *C. diluta* Bieb.

33(11) *C. distans* L.

Sect. 9. Digitatae (Fries) Christ

34(12) C. rhizina Blytt ex Lindblom

Sect. 10. Lamprochlaenae (Drej.) L.H. Bailey

35(13) *C. supina* Willd. ex Wahlenb.

Sect. 11. Microrhynchae Drej. ex L.H. Bailey

36(14) *C. aterrima* Hoppe = C. a. subsp. *medwedewii* (Leskov) Egor.

Subgen. 2. Kreczetoviczia Egor.

Sect. 1. Phacocystis Dumort.

37(15) *C. acuta* L. (*C. dichroandra* V.Krecz.)

38(16) *C. transcucasica* Egor.(*C. dacica* Heuff.)

39(17) *C. orbicularis* Boott (*C. kotschyana* Boiss. & Hohen.) = C. o. subsp. Kotschyana (Boiss. & Hohen.) Kukkonen

Subgen. 3. Vignea (P.Beauv.) Peterm.

Sect. 1. Heleoglochin Dumort.

40(18) *C. diandra* Schrank

Sect. 2. Vulpinae (Carey) Christ

41(19) *C. vulpina* L. (C. compacta Lam.)

42(20) *C. otrubae* Podp.

Sect. 3. Phaestoglochin Dumort. ex Kük.

43(21) *C. polyphylla* Kar. & Kir.

44(22) *C. contigua* Hoppe

Sect. 4. Holarrhenae (Döll) Pax

45(23) *C. disticha* Huds. (*C. grossheimii* V.Krecz.)

Sect. 5. Divisae Christ ex Kük.

46(24) *C. divisa* Huds.

Sect. 6. Boernera V.Krecz. ex Egor.

47(25) *C. stenophylla* Wahlenb.= *C. stenophylla* Wahlenb. subsp. *stenophylloides* (V.Krecz.) ex Egor.

Sect. 7. Physodeae Meinsh.

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48(26) *C. pachystylis* J.Gay

Sect. 8. Ovales (Kunth) Christ

49(27) *C. leporina* L.

Sect. 9. Heleonastes (Kunth) Kük.

50(28) *C. canescens* L. (*C. cinerea* Pollich)

Subgen. 4. Psyllofora (Degl.) Peterm.

Sect. 1. Capituligerae Kük.

51(29) *C. oreophila* C.A. Mey.

Carex stenophylla Wahlenb. = C. stenophylla Wahlenb. subsp. *stenophylloides* (V. Krecz.) ex Egor. — It is a species of the *Cyperaceae Juss.nom.cons.* family. This plant species is particularly known for its narrow and long leaves. It is among the narrow-leaved species, but the reason for its false name is that it is different from other species that resemble it or generally show similar characteristics. It often grows near water and in moist places. It has oblong, narrow leaves. Its flowers are small and simple, often aquatic species.

This species is typically found near swamps, meadows or water bodies. It grows in moist soils or in areas adapted to changes in water height and level. The plant plays an important role in water regulation and soil protection in the ecosystem. It is important for vegetation cover and soil stability in natural environments.

Carex pachystylis J.Gay — This species is particularly notable for its morphological characteristics and habitat. Its leaves are short, narrow and flat. They usually come in the form of long and thin fibers. The surface of the leaves can be smooth and sometimes rough. Its flowers are small and neat, usually arranged in spirals and in large numbers. The reason for the name "densely columnar" is that the flowers are arranged in numerous and dense columns. That is, the flowers are very close to each other, which leads to the name of the plant "densely columnar".

Carex pachystylis J.Gay blooms in spring and summer. During the flowering period, the arranged flower heads appear and the plant complements the natural beauty of the environment.

This species often grows near water bodies, in marshy or moist soils. *Carex pachystylis* J.Gay seeks suitable conditions to develop in meadows and other moist environments. It plays an important role in stabilizing the soil and maintaining the balance in the moist environment of the ecosystem. The ecological importance of this species and its soil stabilization function make it an important plant in ecology and nature studies.

Carex pachystylis J.Gay is a species that strengthens the soil structures and protects moist soils in marshy or meadow ecosystems. It supports the natural circulation of water and the ability of the soil to absorb water.

Carex pachystylis J.Gay also differs from other species of the genus *Carex L.* in that its flowers and stipules are particularly dense and compact. This feature is a particularly distinguishing feature of the plant.

Carex diluta Bieb. — The reason why this species is known as "Shining Sedge" is because of the bright and reflective properties of the plant's flowers in natural light.

Carex diluta Bieb. often has long and narrow leaves. The leaves are often shiny and dark green. The flowers of this species are also shiny and elegantly arranged. The flowers consist of small and densely arranged columns. The shiny skin generally has a very strong reflective effect during flowering.

Carex diluta Bieb. usually develops in swamps, near water bodies and in moist soils. This plant species is adapted to changing water levels and grows in areas suitable for irrigation conditions.

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Carex diluta Bieb. also helps to maintain soil moisture and plays an important role in water regulation in ecosystems. It is distributed over a large area in the Batabat plateau of the Nakhchivan Autonomous Republic.

Carex divisa Huds. - This species is particularly notable for its morphological characteristics and habitat. The plant develops in moist and swampy areas. It is especially found in meadows and near water bodies. It thrives in environments that are adapted to rising and falling water levels.

Carex divisa Huds. often has narrow and long leaves. The tips of the leaves are repeatedly cut, hence the name "Segmented Sedge". It is notable for its bright green color. Its flowers are numerous and clustered. The flowers are densely arranged in columns, and these come in various structures. The flowers of this plant are more divided and expanded than those of other species. This is the main feature that distinguishes the plant from other species in the genus *Carex* L.

Carex divisa Huds. participates in the natural circulation of water near water bodies and plays an important role in soil stabilization. By forming a vegetation cover in wetlands and moist areas, it increases the water holding capacity of the soil in the ecosystem.

Carex divisa Huds. helps protect aquatic ecosystems and plays an important role in stabilizing wetlands. This species can help prevent soil erosion in meadows and wetlands.

This species can also be grown as a landscape plant. Its dense flowers and dense columnar structure are aesthetically attractive.

Carex diluta Bieb.

Carex riparia Curt.

Cyperus longus L. — Mainly distributed in subtropical and tropical regions. It is also often found near water bodies and in wetlands. This plant loves moist environments and thrives in soils suitable for irrigation.

Cyperus longus L. has long and flat leaves. Its leaves can extend up to 1-2 meters, which gives the plant a tall and dense appearance. Its stem is erect and reddish in color.

Its flowers are small and numerous, arranged in long spikes. Its color is dark green and yellowish. The plant is distinguished, especially when in bloom, and has a fragrant scent.

Cyperus longus L. is also a plant that helps protect aquatic ecosystems. It plays an important role in stabilizing water and preventing soil erosion. It has been used in traditional medicine for a

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long time. Its rhizomes and roots have aromatic properties. The plant is used to treat various syndromes, especially gastrointestinal problems and gas problems.

Cyperus rotundus L. — This plant is widespread throughout the world and is found in both natural and cultural environments. It has numerous uses and ecological importance. It can grow on all types of soil and has a wide distribution area. This species is often found in irrigated areas, meadows, wetlands and places with moisture. Even in not very complex soils, this plant grows quickly and helps to restore the soil.

Cyperus rotundus L. is usually a small plant. Its leaves are long, narrow and blunt-pointed. This plant often has numerous and parallel leaves. Cyperus rotundus is particularly known for its round, rounded rhizomes. Its fringed roots are thick and allow numerous new plants to form in the soil.

Its flowers are small, simple and densely arranged. The flowers are dark yellowish-green in color. The plant generally produces light and light green flowers.

Cyperus rotundus L. affects the maintenance of soil moisture and water circulation in the ecosystem. This species is found near water bodies and plays an important role in both soil stabilization and water regulation.

This species is sometimes known as a noxious weed in agriculture, because it spreads very quickly and prevents the growth of other plants. In addition, it also has soil-modifying properties, as its rhizomes cause the formation of numerous new plants.

Bolboschoenus maritimus (L.) Palla =*B. planiculmis* — is a perennial plant that grows in moist soils and near water bodies. Its leaves are long, narrow and wrinkled, and the stem is usually erect and thick. The stems are numerous and arranged parallel to each other. Its flowers are small and densely arranged, located in columns. The flowers are usually dark green in color, light in structure and somewhat stiff in appearance.

Bolboschoenus maritimus (L.) Palla is especially widespread near water bodies, in swamps and moist soils. This species is adapted to live in moist areas and meadows. The plant is also widespread on the sea coast and in other tropical-temperate zones.

Bolboschoenus maritimus (L.) Palla plays an important role in both ensuring soil saturation with water in ecosystems and stabilizing swamps and water bodies. This plant helps to regulate aquatic ecosystems and prevent soil erosion. It can also be used as an aquatic plant for decorative purposes in parks and gardens. The slow-growing, dense-growing plant is also an ideal choice for ponds and tropical gardens. However, this species is also useful in purifying and stabilizing aquatic and soil ecosystems.

Schoenoplectus tabernaemontani (C.C.Gmel.) Palla — This plant species is mainly found in water bodies, swamps and moist areas. It plays an important role in ecosystems and is important in water purification and environmental stabilization.

Schoenoplectus tabernaemontani (C.C.Gmel.) Palla is a perennial and aquatic plant species. Its leaves are long, stiff. This species is found in moist and marshy areas, usually on water-covered soils. The flowers of the plant are small and numerous. They are concentrated in long and dense panicles. The flowers are yellowish-green and consist of numerous small flowers. The plant reproduces by rhizomes. The rhizomes spread widely underground and form many new plants.

The plant is widespread near water bodies, in swamps, meadows and moist soils. This plant is actually a species that occurs naturally in tropical and subtropical regions. It also grows easily on the banks of rivers, lakes and other bodies of water.

Schoenoplectus tabernaemontani (C.C.Gmel.) Palla plays an important role in regulating aquatic ecosystems and purifying water. This type of aquatic plant helps protect the environment by purifying water and providing stability in water bodies. Schoenoplectus tabernaemontani also

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protects the soil in wetlands against erosion. This species, which creates vegetation near water bodies, also regulates the water cycle and filters water.

Torulinium caucasicum Palla – This plant is especially common in the Caucasus region. This plant species is found in natural areas and especially in moist soils. It is a perennial plant and grows in moist soils. Its leaves are very narrow and blunt-pointed, typically short and dense. Its stem is thin and tall, and its upper part is densely clustered during the flowering period. Its flowers are small and densely arranged, usually dark green in color, and this plant is especially noticeable when it blooms. The plant reproduces by rhizomes and produces new plants above ground. The rhizomes remain in moist soil for a long time and ensure the development of the plant.

Torulinium caucasicum Palla is mainly found in moist meadows, marshes and near water bodies of the Caucasus region. This species thrives especially in soils with high moisture and grows better in cold climates.

This species plays an important role in soil stabilization and water purification. It helps protect the environment in wetlands and aquatic ecosystems and is important in regulating ecosystems. *Torulinium caucasicum P*alla regulates water circulation and soil moisture, especially in wetlands. This plant creates stability in water bodies and helps protect the environment. Its rhizomes help retain water in the soil and restore vegetation cover.

Carex riparia Curt. - Coastal sedge — is a perennial plant and grows in areas with high moisture. Its leaves are long, narrow and densely arranged.

The stem is erect, thick and hard. The plant usually forms dense vegetation in meadows and along the banks of water bodies. Its flowers are small and are located in panicle-shaped structures consisting of several flowers. The flowers are usually green or yellowish. The flowering period occurs in spring and summer. *Carex riparia* Curt. reproduces by rhizomes. These rhizomes can remain in the soil for a long time and give rise to new plants.

Carex riparia Curt. is usually found near water bodies, on the banks of rivers, lakes and swamps. This plant grows very well in moist soils and in water regulation. Its spreading near water bodies is formed naturally depending on the changes in water levels. In coastal areas and swamps, this plant plays an important role in stabilizing the soil and protecting aquatic ecosystems.

Carex riparia Curt. is important in protecting aquatic ecosystems. Its extensive rhizome system increases the resistance of the soil to waterlogging and erosion. This plant also plays a role in soil stabilization and water purification on the edges of water bodies. It is widely spreading in the wetlands of Shahbuz and Ordubad districts of the Nakhchivan Autonomous Republic.

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