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Species *Suaeda* Forssk. of the Aral-Balkhash region flora in the collections of the Herbarium (AA)

In the article a complete list of specimens of species of the genus *Suaeda* Forssk. ex J.F. Gmel. of the Aral-Balkhash region, stored in the herbarium fund of the Institute of Botany and Phytointroduction (Almaty, Kazakhstan*)* was provided. *Suaeda* species are divided into 5 sections (Schanginia C.A. Mey, Lachnostigma Iljin, Conosperma Iljin, Physophora Iljin, Heterosperma Iljin). The aim of the research was to critically study the specimens of species of the genus *Suaeda* of the Aral-Balkhash region, available in the Herbarium (AA) for further revision of the genus. This territory includes 5 floristic regions (14 — Aral Sea, 15 — Kyzylorda, 16 — Betpakdala, 17 — Muyunkum (Moiynkum) and 18 — Balkhash-Alakul.). During the screening of species of the genus within the study region, 240 herbarium specimens were reviewed, belonging to 15 species. A comparison of the representation of species in the collection fund of the Herbarium with the data of literary sources was carried out. Floristic areas have been identified in which, despite the availability of information about the presence of the studied species on their territory, there is no herbarium material. At the same time, floristic areas are noted in which the presence of certain species of *Suaeda* was not previously cited in literary sources, but they are present in the collections of the Herbarium. The degree of study of each region was determined for the further compilation of the current expedition route in order to replenish the herbarium fund. The paper presents a synopsis of the studied group of species with an information block of herbarium labels for each taxon. The features of the distribution of *Suaeda* species of the Aral-Balkhash region in 5 floristic regions with an indication of the number of specimens for each taxon are revealed.

Keywords: species of the genus *Suaeda*, Chenopodiaceae, herbarium fund, section, revision of the genus.

Introduction

Representatives of the genus *Suaeda* Forssk. ex J.F. Gmel. of the family Chenopodiaceae Vent. (Amaranthaceae Juss.) distributed throughout Central Asia and are found, as a rule, in coastal halophytic communities. Of the 40 Central Asian species [1, 2], there are 18 species in the flora of Kazakhstan, 15 (83 %) of which are found in the Aral-Balkhash region.

The purpose of the research is to analyze the representation of herbarium specimens of species of the genus *Suaeda of the* flora of the Aral-Balkhash region in the Herbarium (AA).

The relevance of the study of representatives of the genus *Suaeda* is due to their belonging to the group of important halophytic components of the flora, both desert and steppe regions. Among them are medicinal (*Suaeda microphylla* Pall.) [3], fodder (S. *arcuata* Bunge) [4], technical *(S. salsa* (L.) Pall.) [5] plants. Species of *S. linifolia, S. paradoxa, S. paradoxa, S. arcuata* weeds quite often and can be indicators of anthropogenic disturbance [6]. According to modern research, representatives of *Suaeda* can: biosynthesize natural substances with powerful antioxidant activity; be a source of food and edible oil for animals living in harsh climatic conditions; be a renewable source of energy [7]. They are also potential sources of genes that can be used in selection in the breeding of salt-tolerant varieties of crops [8, 9].

In accordance with the scheme of botanical and geographical zoning of Kazakhstan and Central Asia (within the desert region) [10], the Aral-Balkhash region lies within the North Turan province of the Iranian-Turan sub-region, covering the eastern part of the West North Turan subprovince, as well as the Central and East North Turan sub-province. According to the floristic zoning of Kazakhstan, the study area is located within the following areas: 14 — Aral Sea, 15 — Kyzylorda, 16 — Betpakdala, 17 — Muyunkum (Moiynkum) and 18 — Balkhash-Alakul.

Experimental

The object of the study is the species of the genus *Suaeda.* For the analysis, the herbarium fund (AA) of the Institute of Botany and Phytointroduction (Almaty, Kazakhstan) was used. And also, fundamental floris-

tic summaries were used: “Flora of Kazakhstan”, “Illustrated determinant of plants of Kazakhstan”, “Determinant of plants of Central Asia and Kazakhstan”, and others [11–16].

Results and Discussion

Here is a complete list of studied specimens of species of the genus *Suaeda*, stored in the herbarium fund (AA) of the Institute of Botany and Phytointroduction (Almaty, Kazakhstan) from the Aral-Balkhash region.

Section Schanginia C.A. Mey.

***Suaeda linifolia* Pall.**

Moiinkum Floristic Area (hereinafter referred to as MFR): Songaria. Ad fl. Tschu. 1842. Schrenk A.G. Deter.: Lomonosova M.N.; Syr-Darya dist.Nizhne-Talas district. Tract Uch-Aral. Among the thickets of *Halimodendronarcuatum* (Kara-chingil) on dark loams. 24.08.1930. Hondo E.

Kzyl-Orda fl. district. The right bank of the Syr-Darya River near the station. Berkazan. Ancient terrace. Slightly salty. 16.08.1952. Goloskokov V. P.; Kyzylorda region, Kazalinsky district, lowering of the plain, on meadow saline soils. 13.06.1985. Kazenas O.D.; Kazalinsky rice massif, Uirek site, 1 and 2 deposits from 1990 to 1999, high. 61 m, 29.05.2019. Kudabaeva G.M., Veselova P.V., Shormanova A.A., Bilibayeva B.K., Osmonali B.B.

Aral Sea fl. district. (hereinafter referred to as the PAFR): On the alkaline meadow at the beginning of the sands of Bolshiye Barsuki, near the city of Chelkar along the slopes of the railway. 21.08.1908. Androsov N.V.

Betpakdala fl. district. (hereinafter referred to as BFR): The northern shore of the lake. Balkhash. Turangalyk. Salt marshes. 07.10.1935. Dmitrieva A.A.; Uroch. Ortho-Deresin. Salt marshes. 25.08.1935. Dmitrieva A.A.; The southeastern part of the Betpak-dala desert, the valley of the Kingir River, on salt marshes. 27.07.1941. Kubanskaya Z.V.; Dzhambyl region, Kokterek district, eastern Betpak-dala, on plump salt marshes. 25.08.1949. Vuhrer V.V.

Balkhash-Alakol fl. district. (hereinafter referred to as BAFR): Songaria. Ad lac. Alakul.08.1841. Schrenk A.G.; Eastern Balkhash region. Aksu Taldy-Kurg. puffy salt marshes and clay salt marshes along the left bank of the Aksu River in its lower reaches. 30.08.1926. Pavlov N.V.; Karatal — Uch-Kul. The area between the Karatal River and the Uch-Kul lakes. The middle part of the valley and the channel of Jaman-Sary-bulak. Alkaline meadows (almost salt marsh). 18.07.1928. Shipchinsky N.V.; Lepsinsk. u. Clay salt marshes along the shore of Lake Jalanash-kul. 28.07.1928. Pavlov N.V.; Kapchagay. Alma-Ata dist. Ili district. Karoi tract, valley of the Ili River. On salt marshes on the road from Kazakhstan to the sawmill. Sep. 1930. Pokrovskaya I.M.; The left bank of the Ili River is higher than the village of Iliysky. Floodplain. 18.09.1931. Prozorovsky A.V.; Meadow salt marsh. Azhrekovaya-svedovaya. 20.09.1931. Prozorovsky A.V.; The delta of the Ili River. The Kara-Jida tract on the right bank of the main channel. 18.08.1931. Prozorovsky A.V.; Alma-Ata region. Or. Floodplain of the Talgar River. 09.08.1934. Geld A.I.; Alakul depression. Tau-Chilik Trans-Ili Alatau. Foothill plain, near the village of Chilik. Salt marshes. 01.09.1937. Popov M.G.; Charyn. Trans-Ili Alatau, Charyn River. Uroch. Sortogoy. Ash forest. 04.09.1937. Mikhailova V.P.; Taukums. The mouth of the left bank of the Kaskelenka. Among the Tugaino-sucker grove. 30.09.1949.; Ili basin Usek, Alma-Ata region. Panfilovsky district, the depression of Lake Useksky, on salt marshes. 09.08.1960. Kubanskaya Z.V.; Tau-Chilik, Alma-Ata region. Chilik district, the outskirts of the village of Chilik, on salt marshes. 21.09.1961. Kubanskaya Z.V.

***Suaeda paradoxa* (Bunge) Bunge**

KOFR: The right bank of the Syr-Darya River near the Ber-Kazan station to the south of the lake. Salt marshes with chingil and Elymus. 17.08.1942. Goloskokov V.P.

MFR: Dzhambyl region, the lower reaches of the Chu River. The vicinity of Lake Bolshiye Kamkaly, near the Kzyl-tum spring. 20.08.1942. Kubanskaya Z.V.

***Suaeda microphylla* Pall.**

KOFR: The left bank of the Syr-Darya River. Overgrown hilly sands near the channel and the turn of the river between Chiili and Julek. 11.08.1942. Gamayunova A.P.; Kyzylorda region, Kazalinsky district, Kazalinsky rice massif, Uyrek site, 1 and 2 deposits since 1990 or 1999, high. 61 m. 29.05.2019. Kudabayeva G.M., Veselova P.V., Shormanova A.A., Bilibayeva B.K., Osmonali B.B.

BFR: The southeastern part of the Betpak-dala desert. The valley of the Kok-tal River, among the salt marsh association. 09.08.1941. Kubanskaya Z.V.

BAFR: Eastern Balkhash region. Arganates. Songariae. Arganaty. 1841. Karelin G., Kirilow J.; Sary-Ishik-Atyrau. KaratalTaldy-Kurg. Solonchak in the valley of the Karatala River near the Maylibai tract. 23.09.1928. Pavlov N.V.; Tau-Chilik. Alma-Ata dist.Chilik River Salt marshes behind the estate of the Dungan Chimiza. Aug. 1930. Pokrovskaya I.M.; Tau Chilik. Trans-Ili Alatau. Foothill plain near the village of Chilik. Salt marshes. 01.09.1937. Popov M.G.; Charyn. The lower course of the Charyn River. Uroch. Sary-Togoy. Variegated strata. On the saline ancient terrace on the left bank of the river. 18.06.1955. Goloskokov V.P.; Ili basin. Kalkans. Southwestern spurs of the Dzungarian Alatau. Ulkun-Kalkan Mountains. Kokbastau spring. On salt marshes 14.06.1956. Goloskokov V.P.; Alma-Ata region, Uygur district, east of the village of Kzyl-Arasan, on saline soils. 14.08.1960. Kubanskaya Z.V.; Or. The right-bank floodplain of the Ili River is 80 km below the village of Iliysk. On saline soil. 19.09.1966. Lushpa O.U.; Ili basin Tau-Chilik Alma-Ata region, interfluve of the Chilik River and Lavrovskaya River, southwest of the Salt Lakes, plump salt marsh. 23.07.1969. Lushpa O.U.

***Suaeda altissima* (L.) Pall.**

KOFR: The right bank of the Syr-Darya River, below the city of Aleksandrovsky. In the thickets of shrubs. 22.08.1942. Gamayunova A.P.; The left bank of the Syr-Darya River, 4 km above the Tyurya-tam station. Flood meadow. 11.09.1942. Gamayunova A.P.; Kyzylorda region, Kazalinsky district, Kazalinsky rice massif, Uyrek site, 1 and 2 deposits since 1990 or 1999, high. 61 m. 29.05.2019. Kudabaeva G.M., Veselova P.V., Shormanova A.A., Bilibayeva B.K., Osmonali B.B.

PAFR: Chelkar. On alkaline, highly moist places in the steppe near the city of Chelkar. 30.08.1908. Androsov N.V.

BAFR: The Alakul Trench. Songaria. Ad lac. Alakul. 13.07.1840. Schrenk A.G.; Songariae. Fl. Lepsa. 1841. Karelin G., Kirilow J.; Alakul depression. Lepsinsk. Salt marshes along the shore of Lake Jalanash-kul. 22.06.1928. Pavlov N.V.; Eastern Balkhash region. Karatal — Uch-Kul. The area between the Karatal River and the Uch-Kul lakes. The gorge at the eastern part of the Kurgan-cheku Mountain. At wintering. 15.07.1928. Shipchinsky N.V.; Linchevsky I.A. Sary-Ishik-Atyrau Karatal Lower reaches of the Karatal River, Izgar-Kul. June. 1928. Collec. Pavlov N.V., Deter. Lomonosova M.N.; Lepsy Balkhash-Alakul lowland. The area of the middle reaches of the Lepsa River and the lake. Baskan-kul. Dale. Lepsy River, 12 km below the villages. Romanovka. Upper terrace. 31.07.1934. Linchevsky I.A.

Section Lachnostigma Iljin

***Suaeda dendroides* (C.A. Mey.) Moq.**

BAFR: The Ketmen Mountains. Foothill plain between the village of Chundzha and the Temirlik River. 10.08.1937. Collec. Popov M.G. Deter. Lomonosova M.N.; The middle course of the Charyn River. Kathu Mountains, On the southern slopes of salt-bearing hills. 21.06.1955. Goloskokov V.P.; Southern spurs of the Dzungarian Alatau. Katutau Mountains. On the southern hilly slopes of variegated strata. 28.06.1956. Goloskokov V.P.; Gammada between the Temirlik River and the village of Chundzha. 23.06.1958. Bykov B.A.; Ili basin, Alma-Ata region, Uygur district, Charyn-Temerlik interfluve, east of the Kathu Mountains, on gray-brown saline soils. 24.09.1961. Kubanskaya Z.V.

***Suaeda arcuata* Bunge**

BFR: The southeastern part of the Betpa-dala desert, the valley of the Kingir River, in the Chieva Association. 11.07.1941. Collec. Kubanskaya Z.V. Deter. Lomonosova M.N.; South Kazakhstan region, Suzak district, southwestern Betpak-Dala in the floodplain of the Chu River. 26.07.1949. Samoilova V.A. Deter. Lomonosova M.N.

KOFR: The left bank of the Syr-Darya River. Between Durmen-tobe and Tyurya-tam stations. Flood meadow at the foot of an ancient terrace. 01.09.1942. Collec. Goloskokov V.P. Deter. Vuhrer V.V.

MFR: Floodplain of the Talas River. South Kazakhstan region. Aulie-Ata district. 1930. Collec. Pokrovskaya I.M. Deter. Lomonosova M.N.; On the way. South Kazakhstan region. Aulie-Ata district. Aulie-Ata beet farm. 02.08.1933. Collec. Kornilova V.S. Deter. Lomonosova M.N.; Saxaul plain of the southern outskirts of the village of Moiynkum on the road to Suzak. 11.08.1942. Collec. Kubanskaya Z.V. Deter. Lomonosova M.N.; Western Betpak-dala. The surroundings of As-kazanyn-sor. In the valley of the Chu River. In the inter-hill depressions of hilly fixed sands. 17.08.1946. Collec. Kubanskaya Z.V. Deter. Lomonosova M.N.; Dzhambyl region, the lower reaches of the Chu River, the vicinity of Lake Kamkaly-Kul (large), on salt marshes. 18.08.1947. Collec. Lushpa O.U. Deter. Lomonosova M.N.

Section ConospermaIljin

***Suaeda acuminate* (C.A. Mey.) Moq.**

PFR: Aktobe region, 12 versts from Chelkar station, along the dry clay shore of the slightly brackish lake Kuraili, grows together with *Kalidiumfoliatum*. 19.09.1908. Androsov N.V.; The northern coast of the Aral Sea, the Karabulak site. 20.09.1982. Vuhrer V.V.; Aral Karakum. 8 km east of Jalpak Sora. On the saline plain. 14.09.1982. Fisyun V.V.; Riv. Keysecum. On salty spots. 12.09.1982. Fisyun V.V.; Aral Sea, Kaskakulan Island. Oct. 1982. Wuhrer V.V.; Root Coast. 08.10.1982. Dimeeva L.A.; 3 km, before reaching Tokmak station on the road north of Kaskakulan. 08.10.1982. Dimeeva L.A.; On the drained bottom of the southern coast of Butakov Bay 13.09.2002. Aleshkovsky A.V.

KOFR: The left bank of the Syr-Darya River between Dzhusaly and Kzyl-Tam stations. On the edges of takyr. 31.08.1942. Gamayunova A.P.; Between Kzyl-Tam station and Karmakchi village. Takyrs of an ancient saline terrace near the river. 31.08.1942. Goloskokov V.P.; To the south-west, 15 km from the village of Karmakshi. On saline soils. 10.10.1946. Suvorov N.I.

BFR: The northern shore of the lake. Balkhash. Turangalyk. Salt marshes. 07.10.1935. Dmitrieva A.A.; The southeastern part of the Betpak-dala desert. The valley of the Kengir River, in the *chievoy* association. 11.07.1941. Kubanskaya Z.V.; The southeastern part of the Betpak-dala desert. The valley of the river Turluba-sai, in a shrub-forbs association. 20.07.1941. Kubanskaya Z.V.; Western Betpak-dala, Tamgaly-Jar tract, at the foot of the Wolf Hill, near the spring, on salt marshes. 28.08.1946. Kubanskaya Z.V.; Karaganda region. Zhana-Arkinsky district, center. Betpak-Dala. On loamy soil. 16.06.1949. Samoilova V.A.

BAFR: Songariae. Alakul. 1840. Karelin G., Kirilow J.; Songaria. 08.1840. Schrenk A. G.; Songariae. Fl. Lepsa. 1841. Karelin G., Kirilow J.; Songaria. Ad lac. Alakul. 09.1841. Schrenk°A.G.; Lepsinsk. gravelly desert steppe along the shore of Lake Ala-kul. 29.07.1928. Pavlov°N.V.; Taldy-Kurg. alkaline outskirts of the sands. Balkhash in the lower reaches of the Aksu River. 1928. Pavlov N.V.; Lepsinsk. Clay salt marshes between the villages of Koktyum and Obukhovka. 09.09.1928. Lipschitz S.Yu.; Salt marsh on the right bank of the Leps River near Lake Balkhash. 09.09.1928. Pavlov N.V.; Outcrops of red clays on the slope of the cliffs in the Akchi Area. 16.08.1928. Lipschitz S.Yu.; Saline sands. Alma-Ata region, Taldy-Kurgan district. Taldy-Kurgan beet farm. 27.09.1933. Dmitrieva A.A.; Alma-Ata regio Ili. Floodplain of the Talgar River. Among the wormwood. 10.08.1934. Geld A.I.; The right bank of the river Ili bl. Bakanas. Saxakula thicket on low sandy hillocks. 24.09.1935. Dingelstedt F.; R. Charyn. Tract Sartogoy. Alkaline soils near the river. 10.08.1937. Popov M.G.; Trans-Ili Alatau. Foothill plain near the village of Chilik. Salt marshes to the west of the village. 02.09.1937. Popov M.G.; Alakulsk. district, Shiy tract. 14.09.1937.; Lepsinsk. Valley of the Ili River, 6–7 km from the Ili station on salt marshes. 05.09.1948. Polyakov P.P.; The island against the hayfields of the Colch. Molotov (15 km down from Bakanas). 23.07.1949. Grigorieva E. P.; Southern Balkhash region, floodplain of the Ili River, 20 km northeast of the Kzyl-Aus tract, plump salt marsh. 19.10.1971. Semiotrocheva°N.L.; The right bank of the middle reaches of the Ili River. Terrace above the floodplain in front of the Ayak-Kalkan sanatorium. Along the traps among the sands. 08.06.1971. Goloskokov V.P.

***Suaeda microsperma* (C.A. Mey.) Fenzl**

PAFR: East coast of the Aral Sea, shore.16.07.1977. Deter. Lomonosova M.N.

KOFR: Kzyl-Ordinsk. The area along the scattered outskirts of the sands in the uroch. Bish-arna. 22.09.1929. Deter. Lomonosova M.N.

BFR: South-west coast of Balkhash. Dist. Buru-Baital village. A plump salt marsh on the site of the former Balkhash Bay. 21.08.1934. Deter. Lomonosova M.N.

MFR: Syr-Darya dist. Nizhne-Talas district. Sands between Kara-Chak and Uch-Aral. 18.06.1930. Collec.Pokrovskaya I.M. Deter. Lomonosova M.N.; Dzhambyl region, the lower reaches of the Chu River. South of the Kaplambek tract, on the site of the old Kazakh parking lot. 26.08.1947. Collec. Lushpa O.U. Deter. Lomonosova M.N.

BAFR: The lower reaches of the Karatal River, a grove of small turangs at the tomb of Dos Khan. 16.06.1928. Collec. Pavlov N.V. Deter. Lomonosova M.N.; On the site of former lakes in the vicinity of the village council. 31.07.1949. Collec. Lushpa O.U. Deter. Lomonosova M.N.; The floodplain of the left bank of the Ili River is 40 km from the village of Iliysky, upstream, on salt marshes. 02.10.1949. Collec. Lushpa O.U. Deter. Lomonosova M.N.; On the sandy gray soils of the floodplain of the Ili River (a sandy hillock among the reeds) of the SE of Stalin. Oktyabrsky district. Taldykurgan region 01.07.1956. Collec. Goloskokov V.P. Deter. Lomonosova M.N.; Alma-Ata region. Uygur district, east of the village of Kzyl-Arasan, on saline soils. 14.08.1960. Collec. Roldugin I.I. Deter. Lomonosova M.N.; Alma-Ata region. Uygur

district, in the direction of Kul-Bastau, on saline soils. 14.08.1960. Collec. Roldugin I.I. Deter. Lomonosova M.N.

Section Physophora Iljin

***Suaeda physophora* Pall.**

BFR: Chetsky district, Mointa valley in the floodplain. 28.09.1932. Collec. P. Volkova., Deter. Kutyeva V.; South-west coast of Balkhash. Ocd. Buru-Baital village. A plump salt marsh on the site of the former Balkhash Bay. 21.08.1934. Vinogradov B.; Turangalyk. Salt marshes. 07.05.1935. Dmitrieva A.A.; Salt marshes north of Bertys. 26.07.1935. Dmitrieva A.A.; The coast of the Sary-Chagan Bay in the north. the shore of the lake. Balkhash. Salt marshes. 03.10.1935. Rubtsov N.I.; Northern Balkhash region. The valley of the lower reaches of the Tokrau River. Salt marsh desert. 13.07.1937. Dmitrieva A.A.; North-eastern Balkhash region. Ush-Kzyl hills. Inter-hill meadow-saline valley. 07.07.1938. Dmitrieva A.A.; The eastern part of the Betpak-dala desert. To the south, 2 km away, is the Sasyk-Bulak key. On salt marshes. 14.06.1940. Kubanskaya Z.V.; Karaganda region, Chetsky district, eastern Betpak-dala, salt marsh. 07.09.1949. Polyakov P.P.; Kazakh hills. Salt marsh north of the hill of Bektauata. 07.09.1955. Demchenko L.A.

KOFR: The left bank of the Syr-Darya River between Durmen-Tyube and Tyurya-tam stations. Sandy salt marshes with *Anabasis salsa*. 11.09.1942. Goloskokov V.P.

MFR: Songaria. Ad fl. Tschu. 14.08.1842. Schrenk A.G.; Nizhne-Talas district. Moiynkum State Farm Sheep breeder. There are salt marshes near the lake. 14.06.1933. Kornilova V.S.

BAFR: Songaria. Ad lac. Dschalanaschkul. 7.06.1841. Schrenk A.G.; Gravelly desert steppe along the shore of Lake Ala-kul. 20.07.1928. Pavlov°N.V.; Lepsinsk. Thickets of Tamarix on hilly (forest-like) sands in the Ebinor Pass. 04.09.1928. Lipshitz°S.Y.; The territory of the state farm "Tas-Bulak". The northern shore of Lake Sasyk-kul. 23.08.1931. Volkova P.A.; Terrace above the floodplain of the left bank of the Ili River, in the area of the middle reaches of the Kur-Chilik River. On salt marshes. 06.10.1949. Lushpa O.U.; The lower course is near the bridge to the village of Chundzha. Along the rocky-clayey variegated cliffs to the river. 18.06.1955. Goloskokov V.P.; Southwestern foothills of the Dzungarian Alatau. Ulkun-Kalkan Mountains. Kok-bastau spring. On salt marshes. 14. 06. 1955. Goloskokov V.P.; Dzungarian Gate, the coast of the lake. Jalanash-Kul. In saline places. 04.07.1960. Roldugin I.I.; Southeast. Balkhash region, the lower reaches of the Chilikty River, near the sec. kolhoz. "30" years of Kazakhstan" in saline places. 27.06.1960. Roldugin I.I.; Alma-Ata region; between the Chilik River and the Lavrovskaya River, southwest of the Salt Lakes, a plump salt marsh. 25.07.1969. Lushpa O.U.; Southern spurs of the Dzungarian Alatau. The spring of Kokbastau between the mountains B. and M. Kalkan. On salt marshes. 16.06.1971. Deter. Goloskokov V.P.

Section HeterospermaIljin

***Suaeda salsa* (L.) Pall.**

BAFR: Balkhash-Alakul. Eastern Balkhash region. Karatal — Uch-Kul. The area between the Karatal River and the Uch-Kul lakes. The southeastern outskirts of the lake. Sary-Kul. Salt marsh. 16.08.1928. Collec. N.V. Palov, Deter. Lomonosova M.N.

***Suaeda prostrata* Pall.**

BAFR: Taldy-Kurg. Solyankovayastepped on the left cliff of the Aksu River below the village of Aksu. 26.07.1928. Collec. N.V. Palov, Deter. Lomonosova M.N.

***Suaeda corniculata* (C.A. Mey.) Bunge**

BFR: West Betpak-dala. The sands of Semen-kum, on the litter near the sands. 02.09.1946. Kubanovskaya°Z.V.

PAFR: Aral Karakum, sec. Keysecum. On saline spots. 12.09.1982. Fisyun°V.V.

BAFR: Songaria. Ad fl. Bulansu (Bilensy). 24.07.1843. Schrenk A.G.; Taldy-Kurg. puffy salt marshes and clay salt marshes along the left bank of the Aksu River in its lower reaches. 02.09.1928. Pavlov N.V.; Clay salt marshes near the lake Jalanash-kul. 27.08.1928. LipshitsS.Yu.; Taldy-Kurg. Along the shore of the Salt Lake in the hilly sands on Lake Balkhash near the mouth of the Aksu River. 09.09.1928. Pavlov N.V.; The shore of Balkhash in the lower reaches of the Aksu; salt marshes between sand. Hills. 09.09.1928. Smirnov V.I.; The valley of the Lepsa River, plump salt marshes on the right bank in the lower reaches of the river. 12.09.1928. Smirnov V.I.; The area between the Karatal River and the Uch-Kul lakes. The southeastern outskirts of the lake. Sary-Kul. Salt marsh. 16.08.1928. Shipchinsky N.V.; Lepsa. 1928. Smirnov V.I.; Balkhash-Alakul lowland. The area of the middle reaches of the Lepsa River and the lake. Baskan-kul. Dale. Lepsy River, 6 km above the villages. Romanovka. Saline floodplain. 05.09.1934. Linchevsky I.A.,

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***Suaeda heterophylla* (Kar. et Kir.) Bunge**

BAFR: The area between the Karatal River and the Uch-Kul lakes. At the key of Sary-bastau. Salt marsh. 17.07.1928. Shipchinsky N.V.; Taldy-Kurg. Along the shore of the Salt Lake in the hilly sands on Lake Balkhash near the mouth of the Aksu River. 09.09.1928. Pavlov N.V.; Ili district. The left bank of the Ili River is 6 km higher than the village of Iliysky. Kara-su tract. Floodplain. Meadow salt marsh. Azhrekovaya-svedovaya. 20.09.1931. A. Prozorovsky. Deter. Lomonosova M.N.; Alma-Ata region. Or. Floodplain of the Talgar River. 09.08.1934. Geld A.I.; Dist. st. Iliysk. Floodplain of the Kaskelen River. 06.10.1936. Popov°M.G.; Trans-Ili Alatau. Foothill plain near the village of Chilik. Salt marshes. 01.09.1937. Popov M.G.; Delta of the Ili River. Kok-Uzyak duct. 15.09.1937. Moritz L.D.; The floodplain of the left bank of the Ili River is 30–40 km from the village of Iliysk. Spots among reeds and sedges. 02.10.1949. Lushpa O.U.; The floodplain of the left bank of the Ili River is 62 km upstream from the village of Iliysk, on puffy salt marshes. 06.10.1949. Lushpa O.U.; Alma-Ata region, the vicinity of the village of Kul-Bastau, on saline gray-brown soils. 14.08.1960. Kubanskaya Z.V.

***Suaeda kossinskyi* Iljin**

BAFR: Balkhash-Alakul. Eastern Balkhash region. Karatal — Uch-Kul. The area between the Karatal River and the Uch-Kul lakes. The southeastern outskirts of the lake. Sary-Kul. Salt marsh. 16.08.1928. Pavlov N.V.; Deter. Lomonosova M.N.

***Suaeda crassifolia* Pall.**

BAFR: Songaria. Ad lac. Akakul. 22.07.1841. Schrenk A.G.; The area between the Karatal River and the Uch-Kul lakes. The southeastern outskirts of the lake. Sary-Kul. Salt marsh. 16.08.1928. Pavlov N.V. Deter. Lomonosova M.N.; Taldy-Kurg. Along the shore of the Salt Lake in the hilly sands on Lake Balkhash near the mouth of the Aksu River. 09.09.1928 and 12.09.1928. Pavlov N.V. Deter. Lomonosova M.N.; Alma-Ata region, st. "Balkhash" Turksib, near the Balkhash Bay. The shore of the bay. 13.09.1935. Mironova O.P. Deter. Lomonosova M.N.; Alma-Ata region, st. "Balkhash", near the lake. Balkhash along the shore of the bay. 13.09.1935. Mironova O.P.; On the shore of the lake. Balkhash near the village of Ashchesu in the strip flooded in a storm. 1947. L. Gvozdeva. Deter. Lomonosova M.N.

PAFR: The northern coast of the Aral Sea is the Karabulak target. 20.09.1982. Collec. Fisyun V.V. Deter. Vuhrer V.V.; Aral Sea region. Aral Sea The eastern coast of the Aral Sea, Kaskakulan Island, near the well. 07.10.1982. Collec. Fisyun V.V. Deter. Lomonosova M.N.; Kyzylorda region. The coast of the Aral Sea. Bank. 12.09.1977. Deter. Lomonosova M.N.

The data in the table show that the actual representation of herbarium specimens of *Suaeda* representatives in the Herbarium (AA) in comparison with the data of literary sources is not complete (Table).

Table

Representation of herbarium specimens in the Herbarium (AA)

№	Species	14. Pre-Aral region	15. Kyzyl-Orda	16. Betpakdalinsky	17. Moiynkumsky	18. Balkhash-Alakol
Section Schanginia						
1	*S. linifolia*	**1/***	**4/***	**4**	**3/***	**20/***
2	*S. paradoxa*		**1/***		**1**	
3	*S. microphylla*	**1/***	**2/***	**1**	*	**14/***
4	*S. altissima*	**2/***	**4/***		*	**6/***
Section Lachnostigma						
5	*S. dendroides*	*				**10**
6	*S. arcuata*	*	**1/***	**2/***	**5/***	**2/***
Section Conosperma						
7	*S. acuminata*	**13/***	**3/***	**9**	**1**	**27/***

8	*S. microsperma*	**1/***	**1**	**1**	**3**	**8**
Section Physophora						
7	*S. physophora*	**3/***	**1**	**11/***	**2/***	**15/***
Section Heterosperma						
8	*S. corniculata*	**1**			**1**	**24/***
9	*S. heterophylla*	*	**1/***	**3**	**1/***	**13/***
10	*S. kossinskyi*	**2**				*
11	*S. salsa*	*				**2**
14	*S. prostrata*	*				**1**
15	*S. crassifolia*	**6/***	*	*	*	**8**
	Overall	**30**	**18**	**17**	**31**	**150**
Note — **1/*** — Number of specimens in the herbarium / availability of specimens according to literature data						

There are species, specimens of which are presented in the herbarium fund, but are not mentioned in the "Flora of Kazakhstan", "Determinant of plants of Central Asia":

– *Suaeda linifolia* is not given for the Betpakdala floristic region:
– *S. paradox* for Moiynkum;
– *S. microphylla* for Betpakdala,
– *S. dendroides* for Balkhash-Alakol,
– *S. acuminata* for Betpakdalinsky and Moiynkumsky,
– *S. physophora* for Kyzyl-Orda,
– *S. corniculata* for the Pre-Aral and Moiinkum,
– *S. heterophylla* for Betpakdala,
– *S. kossinskyi* for Pre-Aral,
– *S. salsa* for Balkhash-Alakol,
– *S. microsperma* for Kyzyl-Orda, Betpakdala, Moiynkum and Balkhash-Alakol,
– *S. prostrate* for Balkhash-Alakol,
– *S. crassifolia* for Balkhash-Alakol.

And, on the contrary, specimens of some species noted for the Aral-Balkhash region in literary sources [15, 17], unfortunately, are absent in the Herbarium Fund (AA):

– *Suaeda paradoxa* fees are absent from the Pre-Aral and Betpakdala floristic regions.
– *S. microphylla* from Moiynkum;
– *S. altissima* from Betpakdala and Moiynkum,
– *S. dendroides, S. heterophylla, S. salsa, S. arcuata, S. prostrate* from Pre-Aral,
– *S. kossinskyi* from Balkhash-Alakol,
– *S. crassifolia* from Kyzyl-Orda, Betpakdala and Moiynkum.

Conclusion

Based on the results of the study of species of the genus *Suaeda* of the flora of the Aral-Balkhash region in the collection fund of the Institute of Botany and Phytointroduction (AA), it was revealed that the largest number (150 sheets) of herbarium specimens are presented from the Balkhash-Alakol floristic region. The second place in terms of the volume of herbarium specimens is occupied by the Aral Sea and Betpakdala districts (30 sheets each). In the Kyzyl-Orda floristic region, 18 herbarium specimens of the genus are presented, and in the Moiynkum district — 17.

The analysis of the study of herbarium materials made it possible to identify the degree of knowledge of the genus *Suaeda* in the study area, in particular, the peculiarities of the distribution of species in floristic areas.

Considering the data obtained, the applied aspect of this study is the potential possibility of compiling an optimal route through the studied regions to fill in the missing material.

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С. Үсен, П.В. Веселова, Г.М. Кудабаева, М.С. Курманбаева, Б.Б. Осмонали

Гербарий (АА) коллекциясындағы Арал-Балқаш аймағының флорасының *Suaeda* Forsskex J.F. Gmel. түрлері

Мақалада Ботаника және фитоинтродукция институтының (Алматы қ., Қазақстан) гербарий қорында сақталған Арал-Балқаш аймағының *Suaeda* Forssk. exJ.F. Gmel. тұқымдас түрлері үлгілерінің толық тізбесі келтірілген. *Suaeda* түрлері 5 секцияға бөлінеді (Schanginia C.A. Mey, Lachnostigma Iljin, Conosperma Iljin, Physophora Iljin, Heterosperma Iljin). Зерттеудің мақсаты — гербарийде (АА) бар үлгілерді әрі қарай тексеру үшін Арал-Балқаш аймағындағы S*uaeda* тұқымдас түрлерінің үлгілерін жүйелі зерттеу. Бұл аумаққа 5 флористикалық аудан (Арал маңы — 14, Қызылорда — 15, Бетпақдала — 16, Мойынқұм — 17 және Балқаш-Алакөл — 18) кіреді. Зерттелетін аймақ шегінде түрлерге скрининг жүргізу барысында 15 түрге жататын 240 гербарий үлгілері қаралды. Гербарийдің коллекциялық қорындағы түрлердің ұсынылуын әдеби көздерден алынған деректермен салыстыру жүргізілді. Зерттелетін түрлердің олардың аумағында болуы туралы мәліметтердің болуына қарамастан, гербарий материалы жоқ флористикалық аудандар анықталды. Сонымен қатар, флористикалық аймақтар атап өтілді, оларда *Suaeda*-ның жекелеген түрлерінің табылуы бұрын әдеби дереккөздерде көрсетілмеген, бірақ олар гербарий жинақтарында бар. Гербарий қорын толықтыру

мақсатында одан әрі нақты экспедиция маршрутын құрастыру үшін әр аймақтың зерттелу дәрежесі анықталды. Жұмыста әр таксонға арналған гербарий жапсырмаларының ақпараттық блогын келтіре отырып, зерттелетін түрлер тобының қысқаша мазмұны берілген. Арал-Балқаш аймағының *Suaeda* түрлерінің әр таксонға арналған үлгілерінің санын көрсете отырып, 5 флористикалық аудан бойынша таралу ерекшеліктері анықталды.

Кілт сөздер: *Suaeda* туысы түрлері, Chenopodiaceae, гербарий қоры, Section, түрлерді тексеру.

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Виды *Suaeda* Forssk. ex J.F. Gmel. флоры Арало-Балхашского региона в коллекциях Гербария (AA)

В статье приведен полный перечень образцов видов рода *Suaeda* Forssk. ex J.F. Gmel. Арало-Балхашского региона, хранящихся в Гербарном фонде Института ботаники и фитоинтродукции (г. Алматы, Казахстан). Виды *Suaeda* распределены по 5 секциям (Schanginia C.A. Mey, Lachnostigma Iljin, Conosperma Iljin, Physophora Iljin, Heterosperma Iljin). Целью исследований являлось критическое изучение образцов видов рода *Suaeda* Арало-Балхашского региона, имеющихся в Гербарии (AA) для дальнейшей ревизии рода. Эта территория включает в себя 5 флористических районов (14 — Приаральский, 15 — Кызылординский, 16 — Бетпакдалинский, 17 — Муюнкумский (Мойынкумский) и 18 — Балхаш-Алакульский). В ходе проведения скрининга видов рода в пределах изучаемого региона было просмотрено 240 гербарных образцов, принадлежащих 15 видам. Проведено сопоставление представленности видов в Коллекционном фонде Гербария с данными литературных источников. Выявлены флористические районы, в которых, несмотря на наличие сведений о присутствии изучаемых видов на их территории, гербарный материал отсутствует. В то же время отмечены флористические районы, в которых нахождение отдельных видов *Suaeda* ранее в литературных источниках не приводилось, однако в коллекциях Гербария они присутствуют. Определена степень изученности каждого региона для дальнейшего составления актуального экспедиционного маршрута с целью восполнения Фонда гербария. Авторами представлен конспект изучаемой группы видов с приведением информационного блока гербарных этикеток для каждого таксона. Выявлены особенности распределения видов *Suaeda* Арало-Балхашского региона по 5 флористическим районам с указанием численности образцов для каждого таксона.

Ключевые слова: виды рода *Suaeda, Chenopodiaceae,* гербарный фонд, секция, ревизия рода.

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