

prevent skin and hair diseases, as well as ear diseases. It is also used effectively in women's gynecological diseases. The composition of peach oil is similar to almond oil, it can be used instead of almond oil. Charcoal tablets can be prepared from peach kernels by burning their skins, grinding them in a mill, passing through a 0.20 mm kapron sieve.



Figure-3. Dry peach oil.

Research results and conclusions By products separated from fruit juice production plants are usually used in livestock or as fertilizer in fields. Many fruit kernels contain many chemical substances, which are among the elements that are necessary and useful for human health. Currently, as a result of our scientific research, we are conducting research in order to establish complex processing of such fruit seeds. Studying the morphology of all types of pome fruits, identifying ways to solve the problems encountered in their industrialization, and determining optimal methods are supported in practice based on theoretical knowledge.

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MODERN STATE OF URBAN FLORA OF ANDIJAN CITY

This article provides information on the distribution and current status of plant species in the urban flora of Andijan city. A preliminary species list of invasive flora is also provided. Based on the conducted field studies, scientific sources and large-scale analysis of herbarium samples, it was found that 315 species of plants belonging to 47 families, 196 genera, and 57 invasive plants belonging to 43 genera are found in the urban flora of Andijan city. Information about distribution biotopes of species, life forms, and ecological groups in relation to humidity is given.

Key words: adventive species, invasive species, xenophyte, ergaziophyte , biotope, ruderal.

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СОВРЕМЕННОЕ СОСТОЯНИЕ ГОРОДСКОЙ ФЛОРЫ ГОРОДА АНДИЖАНА

В этой статье представлена информация о распространении и текущем статусе видов растений в городской флоре города Андижан. Также приводится предварительный список видов инвазивной флоры. На основании проведенных полевых исследований, научных источников и масштабного анализа гербарных образцов было установлено, что в городской флоре города Андижан встречается 315 видов растений, относящихся к 47 семействам, 196 родам и 57 инвазивных растений, относящихся к 43 родам. Дана информация о биотопах распространения видов, жизненных форм и экологических групп в зависимости от влажности.

Ключевые слова: адвентивные виды, инвазивные виды, ксенофит, эргазиофит, биотоп, рудерал.

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АНДИЖАН ШААРЫНЫН ШААРДЫК ФЛОРАСЫНЫН АЗЫРКЫ АБАЛЫ

Бул мақалада Анжиян шаарынын флорасындагы өсүмдүктөрдүн түрлөрүнүн таралышы жана учурдагы абалы жөнүндө маалымат берилет. Ошондой эле инвазиялык флоранын түрлөрүнүн болжолдуу тизмеси келтирилген. Жүргүзүлгөн талаа изилдөөлөрүнүн, илимий булактардын жана гербарий үлгүлөрүнүн масштабдуу анализинин негизинде Анжиян шаарынын шаардык флорасында 315 өсүмдүктүн 47 үй-бүлөгө, 196 урууга жана 57 инвазиялык өсүмдүктөрдүн 43 урууга таандык экендиги аныкталды. Биотоптор түрлөрдүн, жашоо формаларынын жана нымдуулукка жараша экологиялык топтордун таралышы жөнүндө маалымат берилет.

Негизги сөздөр: адвентивдик түрлөр, инвазивдүү түрлөр, ксенофиттер, эргазиофиттер, биотоп, рудерал.

Introduction. Today, the natural flora is changing significantly due to human economic activities, which can lead to the spread and increase of adventive (invasive) species and, conversely, the decline of biodiversity.

In the last decade, the adverse effects of anthropogenic factors on the biosphere are gaining global importance. As a result, the rapid economic development of society has a serious impact on the diversity of plants in ecosystems. Global studies show that the introduction of alien species into the flora and the expansion of adventive species populations are the second most important threats to biodiversity [10, 13]. Because the increase of foreign species in the flora leads to the weakening of the natural gene pool, the homogenization of the flora, the reduction of the number and range of native species, the decrease of their activity and reproductive capacity, and the disappearance of local populations [5].

Adventitious species are an integral part of the urban ecosystem, and they determine the relevance of research conducted in order to forecast and model the dynamics of changes and development of urban flora [2]. Therefore, at present, the weight of researches on the study of

urban flora and adventive flora is increasing worldwide [6]. In particular, research is being conducted on the introduction process and level of naturalization of adventive species in new areas, the specific features of their bioecology, the formation of secondary habitats, interactions with local flora, and the dynamics of phytocenotic processes occurring in phytocenoses [8, 22]. Such studies allow not only to correctly assess the current environmental situation, but also to predict and change the course of possible events on Earth [3].

It is known that adventive species, mainly invasive plants, are currently considered as a factor causing global changes and causing a significant loss of the economic value of ecosystems. In some sources, there is information that invasive species cause great economic damage and pose a serious threat to human health [4].

Adventitious species (foreign, random species) are a category of alien plants that have adapted to anthropogenic phytocenoses by entering from another environment. Adventive, according to the time of introduction, archaeophytes (entered before the 16th century), neophytes (entered after the 16th century), superneophytes (entered in the 20th century). According to distribution, xenophytes (accidentally introduced), ergaziophytes (escaped in cultivation), Xeno-ergaziophytes (plants cultivated outside the studied area, but accidentally introduced into the area) [12]. According to the degree of naturalization, ephemeroxytes (pulsating species that appear and disappear, species that disappear for a short time), colonophytes (firmly established in new habitats, but do not spread), epecoxytes (quickly species included in the community), agrophytes (aggressive species invading natural communities), the most aggressive adventive species are called invasive [1]. Invasive species manifest themselves by having a unique dominance in each community.

The invasive part of the flora, which is not characteristic of the local flora, is formed in a certain area, primarily as a result of direct or indirect human activity (that is, it is not related to the natural process of florogenesis) [9].

Material and methodology. Generally accepted methods and methods of floristic research were used in the work. Field research was conducted throughout the city of Andijan during the years 2019-2023, in different phases of the growing season. Plant samples were collected in routed methods, floristic descriptions were given to them, occurrence and abundance of invasive plant species in individual habitats were studied separately [21].

The main task during each field survey is to fully determine the composition of the flora by index (quadrats) (by collecting herbarium specimens and filling in field diaries). One of the main tasks is to visit each of the squares at least once for field research, and this corresponds to the principles of grid system mapping [7]. The territory of Andijan city is divided into 142 squares. During the research, plant samples were collected in each square.

Invasion is a multi-step process in which an alien species overcomes potential barriers to naturalization: primarily geographic, ecological, and reproductive [1]. While studying the adventitious part of the flora, *K.SH. Tojibaev* [9], Based on the classification proposed by *VV Protopopova* [16], *AI Pyak* [18] and *GS Antipina* [10].

Plant samples were collected mainly from industrial areas, railway and highways, municipal landfills, landfills, cemeteries, as well as parks, children's playgrounds, residential areas, ditches, roadsides, and suburbs. Preserved natural places on the outskirts of the city, hills, and irrigated lands around the city were also included in the research area [8].

Scientific names of families, genera and species and primary sources of information are cited in the *International Plants Names Index* (www.ipni.org). Modern names of species are given according to *The World Plants Catalog of Life*. Authors of taxa *Authors of Plant Names* based on the manual.

The Google Earth coordinates of the places of growth of the species have been placed.

Received results and their discussion Although the phenomenon of invasion has been studied for centuries, scientists began to consider it a serious threat to global biodiversity only

in the second half of the 20th century [19; 20], this phenomenon began to receive serious attention three decades later [13; 20]. This interest is related not only to the impact on biodiversity and natural ecosystems, but also to the socio-economic consequences [14; 15].

It should be emphasized that under the influence of the human factor, the most important processes in nature, i.e., changes in ecosystems, the introduction and spread of species, are the cause of the destruction of biodiversity. As a result, adventitious, especially invasive species that have entered from abroad gradually enter natural populations and begin to show negative effects on them. It reduces their areas and the number of species. Interbreeding with local species produces hybrid individuals.

In the flora of Uzbekistan, invasive plants consist of 228 species, mainly xenophytes and argiophytes [9]. The research conducted in the city of Andijan showed that 57 invasive species belonging to 17 families and 43 genera grow in the urban flora of the region. Of these, 51 species are dicotyledonous (*Magnoliopsida*), and 6 species are monocotyledonous (*Liliopsida*) invasive plants. The analysis of invasive plants by families shows that the families *Asteraceae* (12 species), *Brassicaceae* (11 species), *Amaranthaceae* (8 species) and *Poaceae* (6 species) are in the leading positions in terms of the number of species. stands (Fig.1).

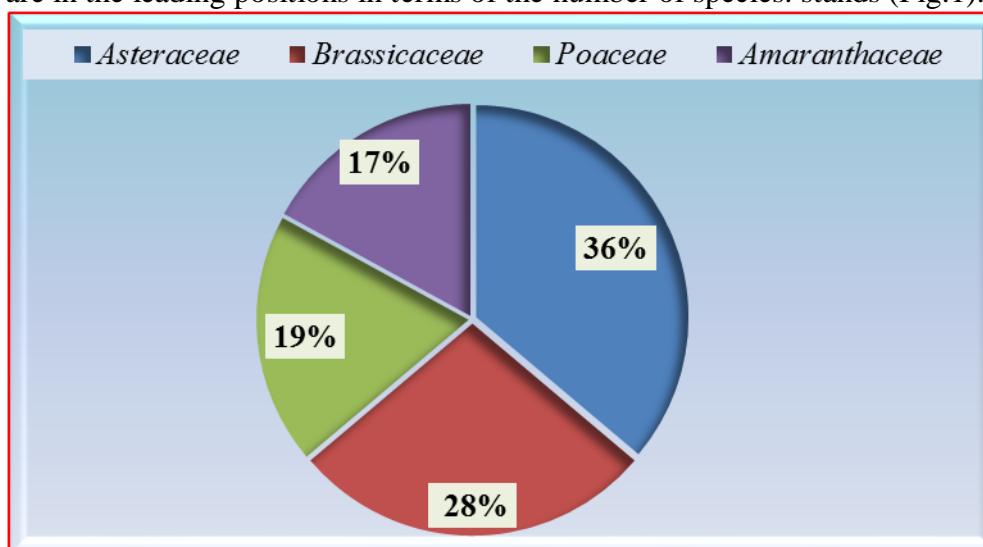


Fig.1. Number of invasive plant species by family

Spectrum of leading families of invasive species found in Andijan city . On the basis of conducted field research and analysis of scientific sources, a preliminary list of invasive species distributed in the urban flora of Andijan city was formed.

***Amaranthaceae* juss**

Amaranthus viridis L. One year. Therophyte. Xerophyte . Xenofit . Pluregional. North America. In ruderal places.

A. blitoides S. Watson . One year . Therophyte . Mesoxerofit . Xenofit . Pluregional . North America. In ruderal places .

A. retroflexus L. One year . Therophyte . Xeromesophyte . Xenofit . Pluregional . North America. Fields , fields , road edges , abandoned places, ruderal places .

A. blitum L. One year. Therophyte. Mesophyte. Ergasiophyte. Pluregional . Southern Europe-Asia. Roads, ruderal places.

A. graecizans subsp. thellungianus (Nevsky) Gusev . One year. Therophyte . Mesoxerophyte . Xenofit . Pluregional . North America. In ruderal places .

A. tricolor L. Annual . Therophyte . Xeromesofit . Xenofit . Pluregional . North America. In ruderal places .

Bassia scoparia (L.) Schrad . Annual , therophyte . Mesoxerophyte . Ergasiophyte . Mediterranean Sea. Ruderal habitats.

Chenopodium murale (L.) S. Fuentes, Uotila & Borsch. Annual, Therophyte. Xeromesophyte. Xenophyte. Mediterranean Sea. Ruderal habitats.

Asteraceae Bercht. & J. Presl

Artemisia annua L. One year. Therophyte. Xerophyte. Eurasia. Xenophyte. On roads, wastelands, ruderal habitats.

Cichorium intybus L. Perennial, Hemicryptophyte. Xeromesophyte. Xenophyte. Mediterranean, Iran-Turonian, plurizonal. Grasslands, ruderal habitats.

Erigeron canadensis L. (*Conyza canadensis* (L.) Cronquist.) Annual. Therophyte. Mesophyte. Hemicosmopolitan, plurizonal. Xenophyte. North America. Ruderal habitats.

Xanthium strumarium L. Annual, therophyte. Xeromesophyte. Europe. Xenophyte. Banks of ditches, sometimes near houses, roads and railways.

Xanthium spinosum L. Annual. Xeromesophyte. Xenophyte. South America. Roadsides, ruderal habitats.

Galinsoga parviflora Cav. One year. Therophyte. Mesophyte. Hemicosmopolitan, plurizonal. Xenophyte. South and Central America. In broken lands.

Lactuca serriola L. Biennial or annual. Hemicryptophyte or therophyte. Xeromesophyte. Xenophyte. Mediterranean-West Asia. Plurizonal. Roadsides, ruderal habitats.

Sonchus oleraceus L. Annual. Therophyte. Mesophyte. Xenophyte. Eurasia. plurizonal. Roadsides, disturbed lands, ruderal habitats.

Symphotrichum novi-belgii (L.) GL Nesom (*Aster novi-belgii* L.). Perennial. Hemicryptophyte. Mesophyte. Ergasiophyte. North America. Neglected gardens.

Tripleurospermum inodorum (L.) Sch. Beep. Two or one year. Hemicryptophyte or therophyte. Mesophyte. Xenophyte. Mediterranean, holarctic, plurizonal. Lawns, neglected gardens, ruderal habitats.

Leuzea repens (L.) DJNHind. (*Acroptilon repens* (L.) DC.) Perennial, hemicryptophyte. Xeromesophyte. Xenophyte. Iran-Turan. Irrigated lands, ruderal habitats.

Taraxacum sect. *Taraxacum* FHWigg. Perennial, hemicryptophyte. Mesophyte. Xenophyte. Eurasia, plurizonal. Grasslands, orchards, irrigated lands, ruderal habitats.

Carduus arabicus Jacq. ex Murray. One year. Therophyte. Xeromesophyte. Xenophyte. Eurasia. Roadsides, abandoned places, ruderal habitats.

Centaurea iberica Trier. ex Spreng. One or two years. Hemicryptophyte. Xeromesophyte. Xenophyte. Southern Europe, the Caucasus, Central and Asia Minor. Ruderal habitats.

Eclipta prostrata (L.) L. Annual or perennial. Therophyte. Xenophyte. North and South America. Grasslands, orchards, irrigated lands, ruderal habitats.

Sonchus asper (L.) Hill. One year. Therophyte. Mesophyte. Xenophyte. Plurizonal, Eurasian. Railway embankment.

Senecio vulgaris L. One or two years. Hemicryptophyte or therophyte. Mesoxerophyte. Xenophyte. Ye vrosiya, plurizonal. Different ruderal habitats.

Brassicaceae Burnett.

Capsella bursa-pastoris (L.) Medic. Annual, therophyte. Mesophyte. Xenophyte. Hemicosmopolitan, plurizonal. Grasslands, orchards, irrigated lands, ruderal habitats.

Cardamine hirsuta L. Annual, therophyte. Mesophyte. Xenophyte. Eurasia. Meadows, gardens, irrigated lands.

Strigosella africana (L.) Botsch. Annual, therophyte. Xenophyte. North Africa, South Europe. Grasslands, orchards, fallows, irrigated lands, ruderal habitats.

Rorippa sylvestris (L.) Bess. Perennial, hemicryptophyte. Mesohygrophyte. North America-Europe-West Asia, plurizonal. Canal and ditch banks, wet places.

Rorippa brachycarpa (CA May.) Hayek. Two or one year. Hemicryptophyte. Mesohygrophyte. Eastern Europe, Western Siberia, Central Asia. On the banks of the canals.

Rhamphospermum arvense (L.) Andr. ex Besser. (*Sinapis arvensis* L.) Annual, therophyte. Mesophyte. Xenophyte. Mediterranean Sea. Holarctic. Ruderal habitats.

Sisymbrium orientale L. (*Sisymbrium loeselii* L.) Biennial or annual. Hemicryptophyte or therophyte. Mesophyte. Xenophyte. Mediterranean - Western Asia. Xenophyte. Ruderal habitats.

Sisymbrium altissimum L. (*S. sinapistrum* Crantz). Two or one year. Hemicryptophyte. Xeromesophyte. Xenophyte. Europe - Mediterranean Sea. Ruderal habitats.

Sisymbrium irio L. Annual. Therophyte. Xeromesophyte. Xenophyte. Eurasia In gardens, roads, irrigated areas.

Eruca vesicaria (L.) Cav. One year. Therophyte. Mesophyte. Ergaziophyte. Mediterranean Sea. In watering places, roadsides.

Euclidium syriacum (L.) R. Br. One year . Therophyte. Mesoxerophyte. Xenophyte . Iran-Turan . Ruderal habitats.

Thlaspi arvense L. One year . Therophyte. Mesophyte . Xenophyte . Ye vroosiya. Different ruderal habitats.

Brassica campestris L. One year . Therophyte. Mesophyte . Xenophyte. Eastern Europe - Asia. Different ruderal habitats.

***Caryophyllaceae* Juss**

Stellaria media (L.) Vill. Annual, Hemicryptophyte . Mesophyte. Xenophyte. Holarctic, plurizonal. Near housing, lawns, ruderal habitats.

***Convolvulaceae* Juss.**

Convolvulus arvensis L. Perennial, hemicryptophyte. Mesophyte. Xenophyte. Hemicosmopolitan, plurizonal. A variety of ruderal and disturbed natural habitats.

***Euphorbiaceae* Juss.**

Euphorbia helioscopia L. Annual, therophyte. Mesophyte. Xenophyte. Europe, West Asia, plurizonal. Ruderal habitats.

Acalypha australis L. Annual, therophyte. Mesophyte. Xenophyte. Asia. Abandoned lands.

***Fabaceae* Lindl.**

Medicago sativa L. Annual or perennial, hemicryptophyte. Mesophyte. Ergaziophyte. Asia Minor. Cultivated as fodder , found in uncultivated and ruderal habitats.

Trifolium repens L. (*Amoria repens* (L.) C. Presl). Perennial. Hemicryptophyte. Mesophyte. Eurasia , plurizonal. Edges of fields, roads, railway embankments, ditches.

Vicia villosa Roth. One year . Therophyte. Mesophyte . Xenophyte . Medium land d . Broken places

***Malvaceae* Juss.**

Malva sylvestris var. *sylvestris*. Biennial or annual , hemicryptophyte or therophyte _ Mesophyte . Ergaziophyte (xenophyte). Medium Earth The sea From culture ran away and ruderal living in places occurs.

Malva neglecta Wallr. One or two years. Hemicryptophyte. Mesophyte. Ergaziophyte (xenophyte) . Iran-Turan . In various ruderal habitats.

Abutilon theophrastus Medic. One year. Ergaziophyte. Xeromesophyte. Cosmopolitan, Southeast Asia . On roadsides, wastelands, ruderal habitats.

Hibiscus trionum L. One or two years. Hemicryptophyte. Mesophyte. Xenophyte . Hemicosmopolitan, Mediterranean Sea. On roadsides, wastelands, ruderal habitats.

***Poaceae* Barnhart.**

Avena fatua L. Annual, therophyte. Mesophyte. Xenophyte. Iran-Turan. Hemicosmopolitan, plurizonal. Ruderal habitats .

Lolium perenne L. Biennial or perennial, hemicryptophyte. Mesophyte. Ergaziophyte. Mediterranean Sea. Landscaping, lawn.

Lolium temulentum L. Annual. Mesophyte . Ergaziophyte . Mediterranean Sea. Landscaping, lawn.

Lolium multiflorum Lam. Perennial. Mesophyte. Ergaziophyte. Eurasia. It is often part of lawn mixtures, marked on the side of the road, in the weeds.

Cynodon dactylon (L.) Pers. Perennial, geophyte. Xerophyte. Xenophyte . Hemicosmopolitan, Mediterranean. On roads, wastelands, ruderal habitats.

Echinochloa crus-galli (L.) Beauv. One year . Therophyte . Mesophyte . Xenophyte . Cosmopolitan, Southeast Asia . Canal banks, various ruderal habitats.

Echinochloa oryzoides (Ard.) Fritsch. One year . Therophyte. Mesophyte . Xenophyte . South Southeast Asia. Canal banks, various ruderal habitats.

Phleum pratense L. Perennial, Hemicryptophyte . Mesophyte . Europe -West Asia, plurizonal _ Meadows, lawns.

Sorghum halepense (L.) Pers. Perennial. Xenophyte (Ergaziophyte). Mediterranean Sea. Banks of canals, various wetlands.

***Polygonaceae* Juss.**

Rumex crispus L. Annual or perennial, hemicryptophyte. Mesophyte. Xenophyte. Holarctic, plurizonal. Landscaped lands, lawns, along ditches, Ruderal habitats .

***Portulaca Ccae* Juss .**

Portulaca oleracea L. Annual, therophyte. Xeromesophyte. Xenophyte. Hemicosmopolitan, plurizonal. Mediterranean Sea. Abandoned lands, railway embankments.

***Plantaginaceae* Juss.**

Veronica persica Poir. Biennial or annual, hemicryptophyte or therophyte. Mesophyte. Xenophyte. Iran-Turan. Holarctic, plurizonal. Near the residence, lawns.

***Solanaceae* Juss.**

Datura stramonium L. Annual, therophyte. Mesophyte. Xenophyte. Central America. Ruderal habitats.

***Papaveraceae* Juss .**

Fumaria vaillantii Loisel. One year. Therophyte. Xeromesophyte. Xenophyte . Western Europe , Mediterranean Sea . Ruderal habitats.

***Resedaceae* Martinov.**

Reseda lutea L. One or two years. Hemicryptophyte. Mesoxerophyte. Xenophyte . The Mediterranean Sea . Lawns, irrigated land.

***Oxalidaceae* R.Br.**

Oxalis corniculata L. (*Xanthoxalis corniculata* (L.) Small). One year . Hemicryptophyte. Mesophyte. Xenophyte . South and North America.

***Ranunculaceae* Juss.**

Adonis aestivalis L. One year . Xeromesophyte . Xenophyte . Ancient Mediterranean Sea. Roadsides, wastelands.

***Geraniaceae* Juss.**

Geranium pusillum L. One year . Therophyte. Mesoxerophyte . Xenophyte . Iran-Turan. In various ruderal habitats.

***Zygophyllaceae* R.BR.**

Tribulus terrestris L. Annual . Therophyte. Xeromesophyte . Xenophyte . Mediterranean Sea. Roadsides, wastelands.

In the course of research on the urban flora of Andijan city, the reasons and ways of invasive species entering the urban flora were analyzed. In the sources, it is explained that the reasons for the occurrence of adventive species are mainly caused by human and transport activities and the introduction of plants [8, 23].

Erigeron canadensis L., belonging to the *Asteraceae* family , can be shown as an example of the introduction of invasive species by humans . This species, which is widespread as an adventive species, is more common around the light industrial enterprises of Andijan city.

Therefore, in areas where production enterprises, especially foreign joint ventures, are located, invasive species have entered the urban flora mainly through human intervention. Currently, vehicles (cars, railways) are also becoming the main migration routes of invasive plants. *Geranium pusillum* L., *Adonis aestivalis* L., and *Sonchus oleraceus* L. can be shown as species introduced into urban urban flora by highways and railways in field studies (Fig. 2). Information on the introduction of foreign species into the local flora can be found in many sources [17]. For example, species such as *Eclipta prostrata* (L.) L., *Oxalis corniculata* L., which are *widespread* in the conditions of the city of Andijan, came mainly through introduced plants (substrate, soil, etc.) .According to the method of introduction, almost all invasive species growing in the flora of Uzbekistan belong to xenophytes - accidentally introduced species. For example, *Erigeron canadensis* L. was brought to the Nuremberg park in 1646 as a rare seaside plant, but in the 18th century, jan. Found as an alien species in Germany. *Galinsoga parviflora* Cav. Introduced to England in 1796, it was found outside the Botanic Gardens 13 years later. But the problem is that many adventive species can grow in a limited area for some time and only then begin to rapidly expand their range [3]



Figure 2. *Adonis aestivalis* L. and *Sonchus oleraceus* L. species in the biotope.

The adaptation of invasive plants and the expansion of their populations in new areas depends on the bioecological characteristics of the species as well as on the natural growth conditions. For example, species such as *Fumaria vaillantii* Loisel., *Rorippa sylvestris* (L.) Besser, *Sonchus oleraceus* L. are native to the Mediterranean region, and now these species are widespread throughout Europe. Also, *Acalypha australis* L., *Euphorbia prostrata* Aiton, which are naturally common in the flora of East Asian countries. species distribution biotopes are increasing.

Amaranthus blitoides S.Watson, *Amaranthus blitum* L., *Erigeron canadensis* L., *Oxalis corniculata* L. species like *Amaranthus blitoides* S.Watson, *Amaranthus blitum* L., *Erigeron canadensis* L., distributed naturally in the flora of South and North America. Species such as *Oxalis corniculata* L. were considered invasive species of the urban flora of Andijan city. It can be considered that the introduction of these species was carried out under the influence of the human factor in many cases. It is a xenophyte native to South American countries (Colombia, Panama, Trinidad and Tobago, Venezuela). *Oxalis corniculata* L. species entered Uzbekistan, particularly the urban flora of Andijan city, not so long ago [8]. This species, which initially grew and developed in greenhouses, is now widely found in city streets and alleys, in residential yards (Fig. 3). Currently, *Oxalis corniculata* L. is the third most widespread plant species and is included in the flora of almost every country. It has even been found in sub-Antarctic islands [12,17].

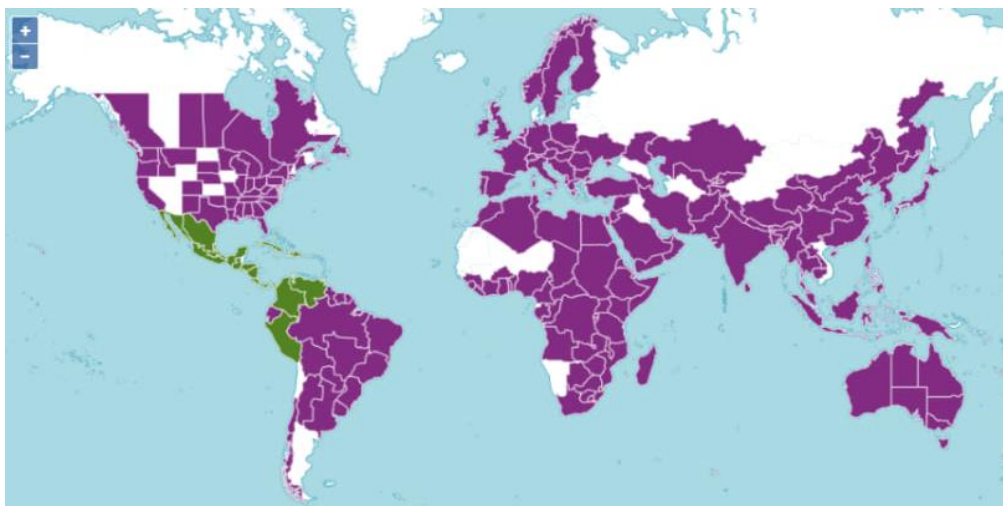


Figure 2. Distribution regions of *Oxalis corniculata* L. Natural and adventitious areas.

Conclusion. Thus, the analysis of modern data on the structure and taxonomic diversity of invasive species in Andijan urban urbaflora allows us to draw the following general conclusions. Until now, the impact of invasive plants on Andijan urban vegetation has not been evaluated. Among the 228 species of invasive plants most common in Uzbekistan [21], only 57 species are present in the urban flora of Andijan city, and most of them do not show high activity in the study area. The spread of invasive and potentially invasive species identified in Urbanoflora has already affected the environment or may pose a threat in the future. Also, the development of a system of ecological and economic assessment of the consequences of the introduction of invasive plant species into the urban flora is considered one of the urgent issues.

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