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NOMENCLATURE HISTORY OF PRUNUS ARMENIACA L. AND BOTANICAL STUDIES OF THE SPECIES IN KAZAKHSTAN

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Abstract

The article is devoted to the nomenclature history and analysis of the current state of knowledge regarding wild apricot (*Prunus armeniaca* L.) in Kazakhstan. It presents a systematic review of changes in the species' nomenclature from its original description by C. Linnaeus (1753) to contemporary interpretations in international databases. The study shows that the prolonged use of the name *Armeniaca vulgaris* Lam. in the Soviet floristic tradition is linked to morphological criteria and historical approaches to Rosaceae systematics, whereas modern molecular-phylogenetic research supports the need to merge the genus *Armeniaca* with *Prunus* sensu lato. The review includes a detailed description of the species' natural range in Kazakhstan, covering the Zailiyskiy Alatau, Dzhungarsky Alatau, Karatau, and Chu-Ili mountains. Ecological conditions, spatial population structure, characteristic habitats, and anthropogenic threats are analyzed. The article also provides an overview of the history of botanical studies of the species in the region, from early floristic research in the 19th century to recent works incorporating molecular-genetic approaches.

Knowledge gaps are highlighted, including the lack of comprehensive population-genetic studies, insufficient data on morphometric variability, and the dynamics of natural populations. The analysis lays the foundation for the next research stage, aimed at the bioecological and genetic investigation of wild P. armeniaca populations in southern Kazakhstan.

Keywords: Prunus armeniaca, common apricot, nomenclature, natural populations, Kazakhstan, distribution range, Rosaceae, history of research

PRUNUS ARMENIACA L. ТҮРІНІҢ НОМЕНКЛАТУРАЛЫҚ ТАРИХЫ ЖӘНЕ ҚАЗАҚСТАНДАҒЫ БОТАНИКАЛЫҚ ЗЕРТТЕЛУІ

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Аңдатпа

Мақала Қазақстан аумағындағы жабайы өсетін кәдімгі өріктің (*Prunus armeniaca* L.) номенклатуралық тарихына және түр жөніндегі қазіргі ғылыми білімнің жай-күйіне талдау жасауға арналған. К. Линнейдің (1753) алғашқы сипаттамасынан бастап халықаралық дерекқорлардағы заманауи таксономиялық тұжырымдамаларға дейінгі кезеңде түр номенклатурасының өзгерістеріне жүйелі шолу ұсынылған. Кеңестік флористикалық дәстүрде *Armeniaca vulgaris* Lam. атауының ұзақ уақыт қолданылуы Rosaceae тұқымдасын жүйелеудегі морфологиялық критерийлер мен тарихи тәсілдермен байланысты екені көрсетілген, ал қазіргі молекулалық-филогенетикалық зерттеулер *Armeniaca* туысын *Prunus sensu lato*

құрамында біріктірудің ғылыми негізділігін дәлелдейді. Шолуда Қазақстандағы түрдің табиғи ареалына егжей-тегжейлі сипаттама беріліп, оған Іле Алатауы, Жоңғар Алатауы, Қаратау және Шу-Іле таулары қамтылған. Экологиялық жағдайлардың ерекшеліктері, популяциялардың кеңістіктік құрылымы, тән мекен ету ортасы және антропогендік қауіп-қатерлер талданған. Аймақта түрді ботаникалық тұрғыдан зерттеу тарихына – XIX ғасырдағы алғашқы флористикалық еңбектерден бастап молекулалық-генетикалық әдістерді қолданатын қазіргі зерттеулерге дейін – шолу жасалған. Түрдің зерттелуіндегі проблемалық тұстар анықталған: кешенді популяциялық-генетикалық зерттеулердің жеткіліксіздігі, морфометриялық өзгергіштік пен табиғи популяциялардың динамикасы жөніндегі деректердің тапшылығы. Жүргізілген талдау Оңтүстік Қазақстандағы *P. armeniaca*-ның жабайы популяцияларын биоэкологиялық және генетикалық тұрғыдан жан-жақты зерттеуге бағытталған келесі зерттеу кезеңіне ғылыми негіз қалайды.

Кілт сөздер: *Prunus armeniaca*, кәдімгі өрік, номенклатура, табиғи популяциялар, Қазақстан, ареал, Rosaceae, зерттелу тарихы.

НОМЕНКЛАТУРНАЯ ИСТОРИЯ PRUNUS ARMENIACA L. И БОТАНИЧЕСКОЕ ИЗУЧЕНИЕ ВИДА В КАЗАХСТАНЕ

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Аннотация

Статья посвящена номенклатурной истории и анализу современного состояния знаний о дикорастущем абрикосе (*Prunus armeniaca* L.) на территории Казахстана. Представлен систематический обзор изменений номенклатуры вида с момента его первоначального описания К. Линнеем (1753) до современных трактовок в международных базах данных. Показано, что длительное использование названия *Armeniaca vulgaris* Lam. в советской флористической традиции связано с морфологическими критериями и историческими подходами к систематике Rosaceae, тогда как современные молекулярно-филогенетические исследования подтверждают необходимость объединения рода *Armeniaca* с *Prunus sensu lato*. В обзор включено детальное описание природного ареала вида в Казахстане, охватывающее Заилийский Алатау, Джунгарский Алатау, Каратау и Чу-Илийские горы. Проанализированы особенности экологических условий, пространственная структура популяций, характерные местообитания и антропогенные угрозы. Приведён обзор истории ботанического изучения вида в регионе – от первых флористических исследований XIX века до современных работ, включающих молекулярно-генетические подходы. Обозначены проблемные зоны в изученности вида: отсутствие комплексных популяционно-генетических исследований, недостаток данных по морфометрической вариабельности и динамике природных популяций. Проведённый анализ формирует основу для дальнейшего исследовательского этапа, направленного на биоэкологический и генетический анализ дикорастущих популяций *P. armeniaca* в Южном Казахстане.

Ключевые слова: *Prunus armeniaca*, абрикос обыкновенный, номенклатура, природные популяции, Казахстан, ареал, Rosaceae, история исследований.

Introduction

The genus *Prunus* L. belongs to the family Rosaceae Juss., subfamily Amygdaloideae Arn., and the tribe Amygdaleae, which includes stone fruit species. According to the Plants of the World Online (POWO) database, the genus *Prunus* comprises approximately 353 accepted species of woody plants [1]. Other reviews report a range of around 200-400 species (e.g., Trees and Shrubs Online [2]), reflecting the high taxonomic complexity, the presence of numerous synonyms, and ambiguous interpretations of intraspecific groups.

Historically, the genus was divided into several independent genera or subgenera (almond, peach, plum, cherry, bird cherry, and cherry laurel). However, modern molecular-phylogenetic studies support the unification of these groups into a single, broadly defined genus, *Prunus* sensu lato [2].

The aim of our study is to provide a historical overview of *Prunus armeniaca* L. as a foundation for further research on its bioecological and genetic characteristics in natural populations of southern Kazakhstan.

Materials and Methods

The study is based on a comprehensive analysis of literature, herbarium materials, and contemporary nomenclatural sources. For the nomenclatural analysis, the following were used: original species descriptions (Linnaeus, 1753; Scopoli, 1772; Lamarck, 1789); data from *Flora of the USSR* (1941) and *Flora of Kazakhstan* (1961-1963); monographs on Rosaceae systematics; modern molecular-phylogenetic studies of the genus *Prunus*; and databases including POWO, IPNI, WFO, and Tropicos. All nomenclatural combinations, historical synonyms, and taxonomic interpretations were cross-checked.

The herbarium analysis was conducted using materials from national herbaria of Kazakhstan, Uzbekistan, Tajikistan, and the Russian Federation, as well as digital collections (GBIF, KAZNU Herbarium, CWU, LE). Localities, habitat types, altitudinal ranges, and morphological characteristics of herbarium specimens were examined. Markers of localities, habitats, altitudinal ranges, and morphological features of specimens were specifically considered.

Field studies are planned for the next stage of the project; in the present work, a preliminary summary of published geobotanical data was used, including descriptions of relief, population structure, associated species, and habitat characteristics.

The cartographic description was based on analysis of floristic publications, geographic referencing of herbarium specimens, topographic maps at scales of 1:100,000-1:500,000, and data on natural zones and altitudinal belts. The species' range was structured according to the main mountain systems: Zailiyskiy Alatau, Dzhungarsky Alatau, Karatau, and Chu-Iliy mountains.

The study was carried out as a review-analytical investigation and includes: critical analysis of floristic data, comparative analysis of historical and contemporary sources, assessment of the completeness of species knowledge, and formulation of scientific conclusions to support further bioecological and genetic studies.

Research Results

Prunus armeniaca L. is one of the oldest cultivated fruit species in Eurasia and has a complex nomenclatural history that reflects centuries of changes in the taxonomic concepts of the genus *Prunus* and related genera within the family Rosaceae.

Scientific study of the apricot began with the work of Carl Linnaeus, who in his seminal work *Species Plantarum* (1753: 474) [3] first described the species under the name *Prunus armeniaca* L. By this name, he included apricot within the genus *Prunus*, which also encompassed plum, almond, cherry, and several other stone fruit species. The original Linnaean name serves as the basionym and holds priority according to the International Code of Nomenclature for algae, fungi, and plants (ICN).

In the second half of the 18th century, European botany saw a growing trend toward a narrower differentiation of genera within Rosaceae. One of the most notable proponents of splitting the genus *Prunus* was Giovanni Antonio Scopoli, who in 1772 proposed separating apricot into a distinct genus, *Armeniaca* Scop. [4]. Building on this concept, J.-B. Lamarck

published a new combination, *Armeniaca vulgaris* Lam., in *Encyclopédie Méthodique* (1789: 2), using the epithet *vulgaris* instead of the tautonym *Armeniaca armeniaca*, in accordance with the nomenclatural practices of that time [5].

Thus, *Armeniaca vulgaris* Lam. does not represent a new species description, but rather a nomenclatural combination based on *Prunus armeniaca* L., transferred to a different genus.

The taxonomic concept recognizing the genus *Armeniaca* as independent was adopted by the Russian and Soviet schools of systematics. Consequently, in the major 20th-century floristic compendia, apricot is listed under the name *Armeniaca vulgaris* Lam.

In the Flora of the USSR (Vol. 10, 1941: 586), the species is described as follows [6]:

A. vulgaris Lam., Encycl. Meth. (1789) I, 2, III. III (1797) 431; DC, Prodr. II (1825) 532 – Prunus armeniaca L., Sp. Pl. ed. I (1753) 474; Koehne, Deutsche Dendr. (1893) 318; C. K. Schn., Handb. Laubholzk. (1908) 630 – Prunus armeniaca var. typica Maxim., in Bull. Acad. Se. St. Peterb. XXIX, 86; Mel. Biol. XI (1883) 654 – Prunus tiliaefolia Salisb., Prodr. (1796) 350 – common apricot.

In the Flora of Kazakhstan (Vol. 4, 1961: 518), the species is also listed as "1. Armeniaca vulgaris Lam., Encycl. Meth. I (1789) 2; Fl. USSR, X (1941) 586 – Prunus armeniaca L., Sp. Pl. (1753) 474 – common apricot (Kazakh: uryuk)" [7].

At the same time, the Linnaean name *Prunus armeniaca* L. was always indicated as the basionym, since according to the rules of the ICN it retains priority.

The use of the genus *Armeniaca* in Soviet floristics is explained both by historical tradition and by morphological arguments: characteristics of the drupe, the wrinkling pattern of the stone, the specific shape of the leaves and petiole glands, as well as features of the bark and buds. Historically, the separation of apricot into a distinct genus was justified based on morphological traits of the fruit, stone, and shoot structure, a view supported in the works of European dendrologists, such as Rehder [8–9].

In the second half of the 20th century and the early 21st century, the development of molecular systematics led to a radical revision of intrafamilial relationships within Rosaceae. Analyses of nuclear and chloroplast DNA sequences (ITS, trnL–trnF, matK, rbcL) demonstrated that the genera *Armeniaca*, *Amygdalus*, *Prunophora*, *Cerasus*, and *Padus* do not form independent monophyletic lineages, but are entirely nested within *Prunus* sensu lato [10–13].

Key studies confirming these findings include the research by Lee & Wen (2001) [11], Bortiri et al. (2006) [12], and Shi et al. (2013) [13], which demonstrated the paraphyly of *Prunus* when the genus *Armeniaca* was maintained. These results provided strong evidence for the necessity of unifying the genera into a single monophyletic group, *Prunus* sensu lato.

Contemporary phylogenetic and agrobotanical studies of apricot also follow the broad interpretation of the genus *Prunus* (Zhebentyayeva et al., 2012 [14]; Faust & Surányi, 2001 [15]).

Currently, the international botanical community recognizes *Prunus armeniaca* L. as the only correct name for the species. This is reflected in major nomenclatural databases, including POWO [1], IPNI [18], World Flora Online [19], and Tropicos [20]. The name *Armeniaca vulgaris* Lam. is considered a historical, nomenclaturally secondary synonym, reflecting the traditions of Soviet and European floristics, but it does not have priority.

Thus, the modern nomenclatural concept integrates morphological, phylogenetic, and historical-taxonomic aspects, restoring the species name to its original Linnaean form.

Table 1. Evolution of Names of *Prunus armeniaca* L.

Year	Name	Author	Source of Publication	Comments
1753	*Prunus armeniaca*	L.	*Species Plantarum*, 1: 474	First scientific description; basionym, priority name
1772	*Armeniaca* (род)	Scop.	*Flora Carniolica*	Proposal to separate apricots into a distinct genus
1789	*Armeniaca vulgaris*	Lam.	*Encyclopédie Méthodique*, I: 2	New combination based on *P. armeniaca*; used in European and Soviet botany
1941	*Armeniaca vulgaris*	Lam.	*Flora of the USSR*, Vol. 10: 586	Official name of apricot in the USSR
1961	*Armeniaca vulgaris*	Lam.	*Flora of Kazakhstan*, Vol. 4: 518	Name adopted within the narrow morphological system
2000-2013	*Prunus armeniaca*	L.	Lee & Wen (2001); Bortiri et al. (2006); Shi et al. (2013)	Molecular data showed that *Armeniaca* is nested within *Prunus*
совр.	*Prunus armeniaca*	L.	POWO, WFO, IPNI	The only officially recognized correct name

The common apricot (*Prunus armeniaca* L.) is among the species with a predominantly disjunct and fragmented range, encompassing a significant part of Central Asia. Its natural distribution developed under conditions of sharply continental climate, mountainous landscapes, and complex orography, resulting in pronounced ecological and community heterogeneity and a mosaic structure of natural populations. Kazakhstan occupies the western and northwestern periphery of the species' Central Asian range, where predominantly relict, isolated, and locally distributed populations occur, typically associated with mountainous regions.

According to the *Flora of Kazakhstan* [7], wild forms of apricot in Kazakhstan occur in the southern and southeastern regions of the country, primarily within the Zailiyskiy Alatau, Dzhungarsky Alatau, Karatau, Chu-Ili mountains, and certain sections of the northern Tien Shan foothills. These areas are most favorable for the species' natural growth due to the combination of warm, dry climate, complex relief, and the presence of rocky, gravelly, and scree substrates.

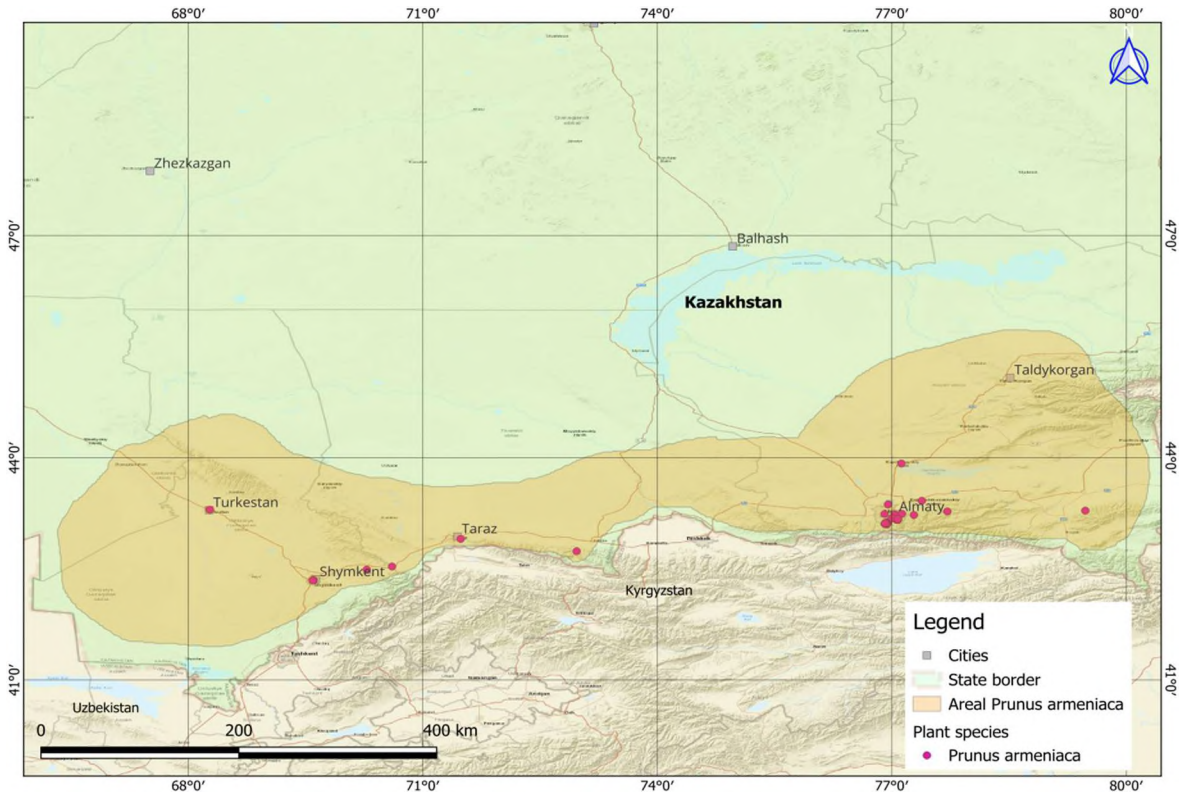

Figure1. Distribution of *Prunus armeniaca* L. in the territory of the Republic of Kazakhstan (based on literature sources)

Based on an analysis of published literature, floristic compendia, and herbarium materials presented in domestic and international studies, a distribution map of *Prunus armeniaca* L. in the territory of the Republic of Kazakhstan was compiled (Fig.1). The map reflects the generalized range of the species and the localities of its occurrence mentioned in scientific publications and floristic reviews.

According to literature data, *Prunus armeniaca* L. in Kazakhstan is predominantly distributed in the southern and southeastern regions of the country, where its natural and secondarily naturalized populations are associated with the mountain and foothill systems of the Western and Northern Tien Shan, the Zhetysu (Dzhungar) Alatau, and the Karatau range. The species is most frequently reported in the territories of Turkestan, Zhambyl, and Almaty regions.

According to authors of floristic studies, the distribution of *P. armeniaca* is patchy and associated with river valleys, foothill slopes, and gorges, where favorable moisture and temperature conditions are established. Central and northern regions of Kazakhstan are not mentioned in the literature as areas of the species' occurrence, highlighting the limited extent of its range under the sharply continental climate of the plains.

Analysis of cartographic and descriptive data indicates that the range of *Prunus armeniaca* in Kazakhstan is fragmented and confined to areas with a long history of human land use, a pattern repeatedly noted by researchers when discussing the origin and dispersal pathways of apricot in Central Asia. Several studies emphasize the difficulty of distinguishing natural populations from those transformed by human activity, which is associated with the long history of cultivation of the species.

Thus, the synthesis of literature data indicates that the southern and southeastern regions of Kazakhstan represent a key part of the range of *Prunus armeniaca* L. in Central Asia, holding significant importance for the study of the species' nomenclatural history, biogeography, and intraspecific differentiation.

Overall, the natural range of apricot in Kazakhstan is characterized by a narrow and fragmented structure, typical of relict and Tertiary species that have persisted in isolated mountainous landscapes.

All natural populations of *Prunus armeniaca* are adapted to a sharply continental climate, with hot summers (+30…+40 °C), cold winters (down to –25…–35 °C), winter drought, and low annual precipitation. These conditions have shaped a unique adaptive complex, including drought tolerance, heliophilous (sun-loving) behavior, and the ability for vegetative regeneration.

Wild apricot grows on rocky slopes, screes, and talus, in gorges and canyons, along outcrops of ancient alluvial deposits, and in dry open woodlands and shrub communities (including *Amygdalus*, *Crataegus*, *Cotoneaster*, and *Rosa*).

Wild populations require monitoring and study of their genetic structure, as the species is included in the Red Book of the Republic of Kazakhstan (2014) and listed among rare and threatened plant species according to the Resolution of the Government of the Republic of Kazakhstan No. 1034 of 31 October 2006, "On the Approval of Lists of Rare and Threatened Plant and Animal Species."

The first records of apricot in the territory of present-day Kazakhstan date back to the 19th century and are associated with the works of E. L. Regel, A. N. Krasnov, N. A. Severtsov, A. P. Fedchenko, and others, who studied the flora of the Tien Shan and Dzhungar Alatau [21–25].

During the Soviet period, the boundaries of the species' range were clarified, habitats were described, morphological variability was studied, and the floristic compendia *Flora of the USSR* [6] and *Flora of Kazakhstan* [7] were compiled.

A significant contribution was made by M. S. Baytenov, who studied the flora of southeastern Kazakhstan and considered apricot as a component of ancient foothill biotopes [26–27].

The late 20th century was marked by the development of studies on reproductive biology, adaptive traits, drought and frost resistance, and population phenology. Special attention was given to the importance of wild forms in breeding programs as sources of resilient alleles.

The advent of molecular-genetic methods has significantly expanded our understanding of the origin and structure of apricot populations in Central Asia.

One of the most significant recent studies is that of Groppi et al. (2021), in which population genomics and whole-genome sequencing methods were used to reconstruct the domestication history of apricot and identify key adaptive events in the species' evolution [28]. Based on a broad set of *Prunus armeniaca* genotypes from various regions of Eurasia—the Caucasus, Central Asia, and the Mediterranean – the authors demonstrated the complex, multi-component nature of the origin of cultivated forms, shaped by multiple introgressions between wild populations from Western and Central Asia. In addition, they identified genomic regions associated with adaptation to arid and mountainous conditions, highlighting the exceptional role of Central Asia as one of the most important centers of the species' genetic diversity.

For Kazakhstan, the findings of Groppi et al. [28] are of particular significance, as they demonstrate that the region's natural mountain populations may harbor unique adaptive alleles, while these populations themselves remain extremely under-studied. This underscores the need

for comprehensive genomic studies of Kazakhstani *Prunus armeniaca* populations and their subsequent inclusion in international genetic databases.

Compared to large-scale international studies, research conducted in Kazakhstan is at an early stage of developing its own molecular-genetic database for natural apricot populations [29]. The first sequencing of Kazakhstani apricot using the MinION platform (2025) marked an important step in this direction; however, the results remain preliminary: the chloroplast genome was assembled in a fragmented form, the sample size was limited both numerically and geographically, and the functional interpretation of the identified genes is still tentative. Nevertheless, this work demonstrates the potential of modern sequencing technologies in Kazakhstan and provides a methodological foundation for further genomic studies.

A significant contribution to the study of the genetic resources of apricot in the region was made by Zaurov et al. (2013) [30], who conducted a comprehensive analysis of the diversity and agrobotanical characteristics of apricot in Central Asian countries. The authors demonstrated that the region is characterized by a unique diversity of wild, semi-wild, and traditional local forms (landraces), many of which represent ancient genetic lineages adapted to an extremely continental climate. The study highlights Central Asia as an important center of apricot origin and draws attention to the threats of genetic resource loss due to habitat degradation and population fragmentation. Although molecular-genetic methods were not employed, the work of Zaurov et al. provides an important context for understanding the historical diversity of the species and underscores the relevance of modern genomic studies in Kazakhstan.

Regional studies conducted in Kyrgyzstan using SSR markers (Uzun et al., 2024) [31] revealed a high level of polymorphism, the presence of distinct genetic clusters, and evidence of long-term evolution of wild and semi-cultivated forms in the mountainous areas of the Tien Shan. These findings are consistent with the conclusions of Groppi et al. (2021) regarding the importance of Central Asia as a key reservoir of genetic diversity. At the same time, the marker-based nature of the approach does not allow reconstruction of deep demographic history, identification of adaptive loci, or determination of introgression pathways, limiting the interpretation of population evolutionary dynamics. An additional limitation is that the study covers only a single country, preventing assessment of the species' phylogeographic structure across the entire region.

Of particular importance for Kazakhstan is the recent study by Romadanova et al. (2025) [32], representing the first comprehensive investigation of natural *Prunus armeniaca* populations within the country. Using material from Almaty region, the authors applied geobotanical analysis, morphometric study, DNA barcoding, and 13 SSR markers, identifying 11 genetically distinct populations with high levels of polymorphism and a structure divided into three geographic clusters. The results confirm the high genetic potential of Kazakhstani wild forms and their important role in maintaining the species' evolutionary diversity. However, the geographic scope of the study is limited to a single mountain system, leaving unresolved questions regarding the overall phylogeography, deep demographic history, and adaptive differentiation of populations in other mountainous regions of Kazakhstan.

In the context of these data, traditional floristic and geobotanical sources (Flora of Kazakhstan, 1961; Abdulina, 1999, etc.) [7, 33] provide valuable context for understanding the current distribution of Prunus armeniaca in the country; however, they do not provide information on the genetic structure of populations, mechanisms of adaptation, or the historical pathways shaping the species' gene pool.

Thus, international whole-genome studies, regional SSR research, and the first genomic studies in Kazakhstan complement each other, while simultaneously highlighting a significant gap—the absence of a comprehensive analysis of natural apricot populations in Kazakhstan using modern genetic, ecological, and morphological approaches. Given the key role of Central Asia in the evolution of *Prunus armeniaca*, conducting such integrated studies represents the next essential step, the results of which will be important both for scientific understanding and for the conservation of the species' natural gene pool.

In addition to genomic and population-genetic studies, a substantial body of international literature focuses on the phytochemical profile and biological activity of *Prunus armeniaca* L. These data are an important component of the comprehensive study of the species, as they demonstrate a wide variability of biologically active compounds that determine the antioxidant, antimicrobial, antitumor, and metabolic properties of apricot. However, most existing studies have been conducted on cultivated or semi-cultivated varieties from Eurasia, while the phytochemical characteristics of wild relict populations in Central Asia, including Kazakhstan, remain virtually unknown.

The recent systematic review by Kitic et al. (2022) [34] summarizes information on the pharmacological potential of apricot, including anticancer, antioxidant, anti-inflammatory, and hepatoprotective properties. The antitumor effect is associated with amygdalin and its metabolites, while the radical-scavenging activity is determined by a complex of phenolic compounds and carotenoids. These findings highlight the high potential for studying bioactive components of wild apricot populations adapted to extremely arid conditions.

Several studies have focused on the quantitative assessment of phenolic compounds, organic acids, flavonoids, and carotenoids in apricot fruits [35–37]. All studies emphasize the high genotypic variability in the content of antioxidants and phytochemical components, as well as the significant influence of environmental factors – climate, habitat altitude, year, and agricultural practices. This is especially relevant for Kazakhstan, where natural populations of *Prunus armeniaca* grow under conditions of a continental climate, considerable altitudinal gradients, and high ecological heterogeneity.

Studies by Yiğit et al. (2009) and Korekar et al. (2011) [38, 39] showed that bitter-stoned forms and high-altitude genotypes often exhibit higher levels of antioxidants and phenolic compounds. This finding is directly relevant for the assessment of wild populations in Kazakhstan, among which ancient bitter-stoned forms are frequently encountered.

Studies focused on the nutritional value and fruit quality [40 – 43] demonstrate the influence of genotype, season, crop load, and growing conditions on the chemical composition of fruits. These results emphasize the need to standardize material collection methods when studying natural populations.

Of additional interest are applied studies [44] focused on the use of apricot kernel oil and pomace in cosmetics and nutraceuticals. The high content of fatty acids and antioxidant compounds in the kernels indicates the potential of wild populations as a source of valuable raw materials.

Thus, the diversity of phytochemical and biological properties of apricot is closely linked to the genotypic and ecological diversity of the species. Given the high ecological variability of *Prunus armeniaca* habitats in Kazakhstan, the study of wild populations may reveal unique phytochemical profiles, providing an important complement to genetic and population research, while also contributing to the conservation of the gene pool and its potential use in breeding and pharmacology.

Conclusion

Prunus armeniaca L. is an ancient fruit species with a rich and complex nomenclatural history, reflecting multiple changes in the systematics of the genus *Prunus* and the family Rosaceae. Modern molecular-phylogenetic data convincingly confirm that the genus *Armeniaca* is nested within *Prunus sensu lato,* which aligns with leading nomenclatural systems and supports the use of the single correct name – *Prunus armeniaca* L.

Kazakhstan occupies an important position in the western part of the species' natural range, preserving relict, isolated, and ecologically heterogeneous populations. These populations are characterized by high morphological and ecological variability, shaped by a sharply continental climate, complex orography, and the mosaic nature of their habitats. The history of studying the species in Kazakhstan spans a wide range of fields, from floristics and geobotany to the initial stages of molecular research.

Comparison of regional and international molecular-genetic data indicates that existing studies of natural apricot populations in Kazakhstan remain fragmentary. International whole-genome studies, regional SSR analyses, and the first sequencing data from Kazakhstan demonstrate high genetic diversity of the species, but do not allow reconstruction of the complete phylogeographic structure, deep demographic history, or adaptive differentiation of populations within the main mountain systems of the country.

The analysis highlights the need for large-scale, comprehensive studies of natural *Prunus armeniaca* populations in Kazakhstan, incorporating bioecological observations, morphometric analysis, and modern genetic approaches, including high-throughput sequencing. Such studies will enable clarification of the gene pool structure, identification of adaptive alleles, characterization of evolutionary processes, and determination of the factors shaping the current population dynamics of the species.

The obtained data will be significant for the conservation of the natural apricot gene pool, the development of population protection measures, and the utilization of Kazakhstan's unique genetic resources in breeding, agrobotanical, and applied programs.

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