

**TAXONOMIC COMPOSITION AND BIOGEOGRAPHICAL DISTRIBUTION OF  
MEDICINAL PLANTS IN THE BUKHARA REGION OF UZBEKISTAN**

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**Abstract:** The present study provides a comprehensive taxonomic and ecological analysis of the wild medicinal flora of the Bukhara region, located in the arid zone of Central Asia. Based on the examination of herbarium materials and floristic databases (FLORUZ, TASH), 224 species of medicinal plants were identified, belonging to 160 genera and 55 families. The dominant families were found to be Asteraceae, Fabaceae, Chenopodiaceae, Poaceae, and Apiaceae, which together constitute the core of the regional medicinal flora. The study reveals that perennials and annuals equally dominate (38.2% each), followed by subshrubs (11.7%), biennials (5.8%), and woody plants (2.9%). Spatial analysis shows that the greatest concentration of medicinal species occurs in the Peshkun, Jondor, and Shafirkan districts, where more than 56% of the regional flora is concentrated. The prevalence of annual herbs reflects anthropogenic pressure and unsustainable pasture use in the Kyzylkum desert landscapes. The findings contribute to understanding the floristic diversity and ecological adaptation of medicinal species in arid ecosystems, serving as a foundation for future conservation and sustainable utilization of plant resources in Uzbekistan.

**Keywords:** medicinal plants; flora of Uzbekistan; Bukhara region; taxonomic composition; ecological distribution; arid ecosystems; Central Asia; plant diversity; mesophytic and xerophytic species; conservation.

**ТАКСОНОМИЧЕСКИЙ СОСТАВ И БИОГЕОГРАФИЧЕСКОЕ РАСПРЕДЕЛЕНИЕ  
ЛЕКАРСТВЕННЫХ РАСТЕНИЙ БУХАРСКОЙ ОБЛАСТИ УЗБЕКИСТАНА**

**Аннотация:** В настоящем исследовании представлен всесторонний таксономический и экологический анализ дикой лекарственной флоры Бухарской области, расположенной в засушливой зоне Центральной Азии. На основе изучения гербарных материалов и флористических баз данных (FLORUZ, TASH) было выявлено 224 вида лекарственных растений, относящихся к 160 родам и 55 семействам. Было установлено, что доминирующими семействами являются Asteraceae, Fabaceae, Chenopodiaceae, Poaceae и Apiaceae, которые вместе составляют ядро региональной лекарственной флоры. Исследование показало, что в равной степени преобладают многолетние и однолетние растения (по 38,2%), за которыми следуют полукустарники (11,7%), двулетники (5,8%) и древесные растения (2,9%). Пространственный анализ показывает, что наибольшая концентрация лекарственных видов наблюдается в Пешкунском, Джондорском и Шафирканском районах, где сосредоточено более 56% региональной флоры. Преобладание однолетних трав отражает антропогенную нагрузку и нерациональное использование пастбищ в пустынных ландшафтах Кызылкумов. Полученные результаты способствуют пониманию флористического разнообразия и экологической адаптации

лекарственных видов в засушливых экосистемах, что служит основой для будущего сохранения и устойчивого использования растительных ресурсов в Узбекистане.

**Ключевые слова:** лекарственные растения; флора Узбекистана; Бухарская область; таксономический состав; экологическое распространение; засушливые экосистемы; Центральная Азия; разнообразие растений; мезофитные и ксерофитные виды; охрана природы.

Introduction. Medicinal plants are widely used in medicine for both the prevention and treatment of various diseases in humans and animals. They are applied not only in their natural form but also as pharmaceutical preparations. Currently, about 40% of all medicines are derived from plant-based raw materials [1].

Central Asia is among the richest regions of the world in terms of floral diversity, containing a large number of endemic species. Many of these plants served as natural sources for the ancient and medieval healers who laid the foundations of pharmacology, pharmaceuticals, phytotherapy, and other branches of medical science [2].

The flora of the Republic of Uzbekistan includes around 4,375 species of wild vascular plants, about 1,200 of which possess medicinal properties and are used in both traditional and modern medicine in Uzbekistan and neighboring countries. At present, 112 species of medicinal plants are officially approved for use in the scientific medicine of Uzbekistan, and more than 80% of them are wild-growing species [5,6].

However, modern scientific literature lacks sufficient information on the medicinal plants of the Bukhara region and their distribution across its botanical-geographical and administrative divisions. The present article provides a taxonomic overview of the medicinal flora of the Bukhara region and analyzes their distribution by administrative districts.

Materials and methods. To compile a comprehensive inventory of the principal medicinal plant species occurring in the Bukhara region, relevant information was sourced from the FLORUZ information-analytical database and the specimen collections maintained by the National Herbarium (TASH). The scientific (Latin) nomenclature of the identified taxa was verified and aligned with internationally recognized references, namely The Plant List [7] and the International Plant Names Index (IPNI) [8]. Data regarding the geographical distribution of these species were derived from authoritative botanical sources, including Flora of Uzbekistan and the Identification Guide to the Plants of Central Asia [3,4].

Results and discussion. The medicinal flora of the Bukhara region comprises no fewer than 200 species, belonging to 160 genera and 50 botanical families. Taxonomic assessment indicates that the dominant families within the regional medicinal flora are Asteraceae (34 species), Fabaceae (17), Chenopodiaceae (15), Poaceae (10), Apiaceae (9), Malvaceae (8), Brassicaceae and Polygonaceae (7 species each), Ranunculaceae (6), and Papaveraceae (4). Collectively, the representatives of these families account for 117 species, forming the core of the medicinal plant diversity in the study area.

In terms of species richness, the most abundant genera are *Artemisia* (7 species), followed by *Alhagi*, *Salsola*, and *Ferula* (each represented by 4 species). The remaining genera are represented by fewer than four species. (fig.1)

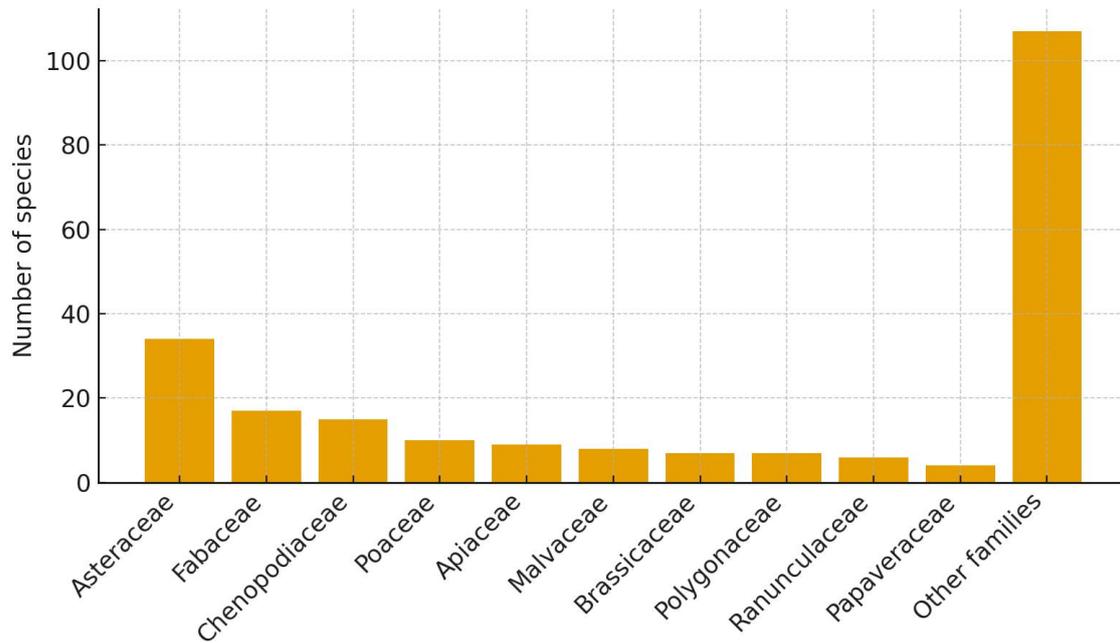


Figure 1 Illustrates the distribution of the main botanical families representing the medicinal flora of the Bukhara region. The Asteraceae family accounts for the highest number of species, followed by Fabaceae and Chenopodiaceae

Overall, the extensive representation of genera and species within the families Asteraceae, Fabaceae, Chenopodiaceae, and Poaceae is a characteristic feature commonly associated with desert ecosystems. The relatively limited occurrence of other families in the region can be attributed to the specific ecological ranges and habitat preferences of their constituent species.

Results and Discussion. An analysis of the biotopic distribution of medicinal plants in the Bukhara region revealed that among the ten most represented genera, perennial and annual herbs are dominant, each constituting approximately 38.2% of the total. They are followed by subshrubs (11.7%), biennial species (5.8%), and a small number of trees and shrubs (2.9% each). The predominance of annual herbs over other life forms is a distinctive ecological feature of the Kyzylkum rangelands, reflecting signs of unsustainable or excessive grazing practices in these areas.

The majority of medicinal plant species are concentrated in the Peshku, Jondor, and Shafirkan districts, which together account for more than 56.7% of the total flora. In contrast, the remaining districts of the region each host no more than 10% of the recorded medicinal species, indicating a significant unevenness in the spatial distribution of the medicinal flora.

Thus, the majority of mesophytic medicinal species—including *Cynodon dactylon*, *Clematis orientalis*, *Alhagi canescens*, *Malva neglecta*, *Chenopodium album*, *Amaranthus retroflexus*, *Trifolium pratense*, *Potentilla supina*, *Glycyrrhiza glabra*, *Typha laxmannii*, *Capsella bursa-pastoris*, *Aeluropus repens*, and *Tribulus terrestris*—are primarily concentrated in the Peshkun and Jondor districts. These species are typically associated with irrigated zones, road margins, arable lands, fallow fields, river valleys, canal banks, water bodies, settlement areas, and orchards interspersed among agricultural crops.

In contrast, the xerophytic medicinal species—such as *Salsola gemmascens*, *Salsola richteri*, *Zygophyllum eichwaldii*, *Astragalus villosissimus*, *Ephedra strobilacea*, *Silene nana*, and *Halothamnus subaphyllus*—are predominantly distributed within desert environments, thriving on saline soils, sandy dunes, gravel plains, and clay substrates.

Conclusions. Based on the results of the conducted analysis, a comprehensive inventory of wild medicinal plants of the Bukhara region has been compiled, encompassing 224 species belonging to 160 genera and 55 botanical families. The dominant families within this flora are Asteraceae, Fabaceae, Chenopodiaceae, Poaceae, Apiaceae, Malvaceae, Brassicaceae, Polygonaceae, Ranunculaceae, and Papaveraceae. These families are most abundantly represented in the Peshkun, Jondor, and Shafirkan districts, which constitute the primary centers of medicinal plant diversity within the region.

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