

SYSTEMATIC ANALYSIS OF HONEY PLANTS IN THE SURKHANDARYA REGION

N. T. Atamuratova¹,

¹Pharmaceutical Education and Research Institute,
Tashkent, Republic of Uzbekistan

D. M. Alikarieva²

²Mirzo Ulugbek National University of Uzbekistan,
Tashkent, Republic of Uzbekistan

Abstract

This study presents a systematic analysis of the species composition of wild honey plants in the Surkhandarya region (southern Uzbekistan). The geographical and ecological characteristics of the distribution of honey plants are examined, along with their taxonomic structure and importance for the development of beekeeping. The number of families, genera, and species is determined, the life forms of honey plants are described, and their forage value is assessed. The data obtained can serve as a basis for the rational use of the region's honey plant resources.

Keywords: Honey plants, species composition, plant communities, beekeeping, flora of Uzbekistan, nectar productivity.

Introduction

Modern agriculture requires the rational use of biological resources, among which honey flora holds a key position. Honey plants provide bee colonies with nectar and pollen, serving as the forage base for the sustainable development of beekeeping, which in turn contributes to the pollination of agricultural crops and the preservation of biodiversity [1, 2].

The flora of the Republic of Uzbekistan includes approximately 4,500 species of higher vascular plants [3], a significant portion of which are honey-producing species that play an important role in regional ecosystems and the beekeeping economy. Under conditions of anthropogenic pressure—such as the expansion of agricultural land, harvesting of medicinal and fodder plants, and the use of

herbicides—the habitats of wild honey plants are shrinking, which negatively affects the resource base for beekeeping [4, 5].

Updating information on the current species composition and distribution of honey flora is a necessary condition for effective natural resource management and for improving the productivity of beekeeping in the region.

Materials and Methods. The research materials were collected in the Surkhandarya region, which encompasses three altitudinal zones: lowland, foothill, and mountainous. The species composition of honey plants was recorded through geobotanical surveys using standard methodologies developed by the Komarov Botanical Institute [3]. Species identification was carried out based on *The Flora of Uzbekistan* [3] and *The Plant Identification Guide of Central Asia* [7].

The collected data were systematized according to taxonomic categories—families, genera, and species. An analysis of life forms was conducted, and the beekeeping value of each species was assessed in terms of nectar and pollen productivity [8, 9].

Results. Taxonomic Composition of the Honey Flora.

The total number of honey plant species identified in the Surkhandarya region was 668, belonging to 270 genera and 59 families. This accounts for approximately 40% of the region's total flora, which is consistent with data from other regions of Central Asia [10]. The families with the highest number of genera include: *Asteraceae* (35 genera), *Lamiaceae* (25), *Fabaceae* (23), *Rosaceae* and *Apiaceae* (22 each), and *Brassicaceae* (17).

The highest species diversity was recorded in *Asteraceae* (93 species), *Fabaceae* (71), *Rosaceae* (67), *Lamiaceae* (53), *Liliaceae* (50), *Apiaceae* (49), *Brassicaceae* (35), *Ranunculaceae* (26), *Boraginaceae* (19), and *Scrophulariaceae* (14), which together account for 71.4% of the total number of honey plant species.

Lower species diversity was observed in families such as *Amaryllidaceae*, *Orchidaceae*, *Portulacaceae*, *Juglandaceae*, *Frankenaceae*, *Violaceae*, *Lythraceae*, *Oleaceae*, *Ebenaceae*, and *Oxalidaceae*, each represented by a single species [11].

Life Forms. The distribution of honey plants by life form reflects their adaptation to regional conditions: herbs constitute 79.7% (533 species), shrubs and subshrubs — 14.8% (99 species), and trees — 5.3% (36 species).

Ecological and Geographical Distribution. Honey plants are evenly distributed across all altitudinal zones, with the greatest species richness found in the foothill (231 species) and mountainous zones (280 species). This pattern is attributed to the diversity of microclimates and soil conditions [12, 13].

Beekeeping Value. An analysis of the forage base showed that 80.5% of the species provide both nectar and pollen, 8.6% supply only pollen, and 10.9% only nectar. This resource structure supports the optimal development of bee colonies, as pollen is the primary protein source for brood rearing, with an annual requirement of approximately 15–17 kg per colony [14, 15].

The findings confirm that the flora of the Surkhandarya region is characterized by a high diversity of honey plants, comparable to other regions of Central Asia [16]. The dominance of *Asteraceae* and ecologically similar families reflects the typical floristic features of the region, marked by a continental climate and complex terrain [17].

The identified honey plant species significantly expand current understanding of the forage base for beekeeping and underscore the need to integrate this new data into regional agroecological programs and biodiversity conservation measures [18].

Conclusion

The conducted systematic analysis allowed for the identification of the structure and distribution of the honey flora in the Surkhandarya region, which is valuable for the rational use of natural resources and the development of beekeeping in the area. The obtained data can contribute to the scientific basis for measures aimed at the conservation and reproduction of honey plants, as well as to increasing the efficiency of agricultural production.

References

1. Struik P.C., Kuyper T.W. Sustainable intensification in agriculture: the richer shade of green. *Agron. Sustain. Dev.* 2017;37:39. <https://doi.org/10.1007/s13593-017-0445-7>
2. Mahon N. et al. Sustainable intensification – “oxymoron” or “third-way”? *Ecological Indicators.* 2017;74:73-97.
3. Flora of Uzbekistan, Vols. I–VI. Tashkent, Publishing House of the Academy of Sciences of the Uzbek SSR, 1941–1963.
4. Devkota K. Beekeeping: Sustainable Livelihoods and Agriculture Production in Nepal. 2020. DOI: 10.5772/intechopen.90707
5. Tijani B.A. et al. Economic Analysis of Beekeeping in Chibok Local Government Area of Borno State, Nigeria. *Nigerian Journal of Basic and Applied Science.* 2011;19(2):285-29.
6. Atamuratova N.T. et al. Honey significance of forest lands in southern Uzbekistan. *IOP Conf. Ser.: Earth Environ. Sci.* 2021;775(1):012013.
7. Plant Identification Guide of Central Asia, Vols. I–VI. Tashkent, Publishing House of the Academy of Sciences of the Uzbek SSR, 1941–1963.
8. Bondarenko N.A. Modern Methods of Studying Honey Plants. Moscow, 2018.
9. Ivanova S.P. Physiology of Bees and Forage Resources. Moscow, 2016.
10. Nikitina I.V. Honey Plants of Central Asia: Taxonomy and Ecology. Tashkent, 2017.
11. Drobov V.P. Plant Resources of the Gissar Range. Tashkent, 1951.
12. Mirzoeva N.F. Biological Diversity of the Flora of Uzbekistan. *Uzbek Botanical Journal.* 2019;54(2):20-30.
13. Sultanov R.A. Climate and Vegetation of the Surkhandarya Region. *Geography and Ecology.* 2018;12(4):60-67.
14. Ivanov V.V. Nutrition of Bees and Forage Plants. *Agriculture Bulletin.* 2015;8:11-17.
15. Petrova E.N. Pollen as Food for Bee Colonies. *Biology Bulletin.* 2016;23(1):14-22.
16. Zhuravleva L.S. Honey Flora of Central Asia: Current State. Tashkent, 2019.
17. Kuznetsov A.A. Flora and Fauna of Central Asia. Moscow, 2017.
18. Karimova G.M. Conservation of Plant Resources of Uzbekistan. Tashkent, 2020