

Diversity and Distribution of Annual Dicotyledonous Weeds in Peanut (*Arachis hypogaea* L.) Agroecosystems

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Annotation: This article analyzes the biological and morphological characteristics of annual dicotyledonous weed species occurring in peanut veryong'oq (*Arachis hypogaea* L.) fields. The study reveals that these weeds are characterized by rapid germination, high seed productivity, and strong ecological adaptability, which negatively affect crop development. It was also shown that their distribution and competitiveness in agroecosystems directly reduce peanut yield. The article highlights the agro-technical importance of identifying and controlling these weed species.

Keywords: Peanut (*Arachis hypogaea* L.), annual dicotyledonous weeds, agroecosystems, phytocenosis, weed phytocompetition, seed productivity, ecological plasticity, phenological development, agrobiocenosis, weed control.

Introduction

In agriculture, weed control is considered one of the most important agrotechnical measures for increasing crop productivity. Weeds, particularly annual dicotyledonous species, strongly compete

with cultivated crops for water, nutrients, light, and growing space, thereby significantly reducing their growth and development [1]. In agroecosystems of peanut crops (*Arachis hypogaea*), annual dicotyledonous weeds are also widely distributed and cause serious damage during the yield formation stage. These weed species are characterized by rapid germination, high seed productivity, and strong adaptability to various ecological conditions. Therefore, studying the biological characteristics and distribution patterns of annual dicotyledonous weeds occurring in peanut fields, as well as developing effective control measures against them, is of great scientific and practical importance [2-4].

Methods

The study was conducted in peanut (*Arachis hypogaea* L.) agroecosystems to identify and analyze annual dicotyledonous weed species. Field observations were carried out during different growth stages of the crop. Weed species were identified based on their morphological characteristics using standard botanical identification methods. Random sampling was applied to assess weed distribution and abundance across the fields. A comparative analysis approach was used to evaluate the ecological adaptability and competitive ability of the dominant weed species.

Results and Discussion

***Amaranthus blitum* (wild amaranth)** – is a widely distributed annual weed in agroecosystems and is distinguished by its high ecological adaptability. The stem is erect or creeping along the ground, reaching 15–70 cm in height, and becomes highly branched during the vegetation period. The leaves are small, obovate in shape, and light green in color, contributing to active photosynthetic processes [5]. The generative organs develop as dense inflorescences located in the leaf axils, which increases seed production efficiency. The fruit is an ovate or elliptical capsule that opens transversely, facilitating the rapid dispersal of seeds. The seeds are very small (1.2–1.5 mm) and are widely dispersed by wind, water, and agrotechnical factors. The plant flowers during July–August and produces seeds within a short period of time. Therefore, it acts as a strong competitor with cultivated crops for moisture, nutrients, and light. This species occurs throughout most regions of Uzbekistan, although its distribution is limited in some areas. In general, the rapid growth, high seed productivity, and adaptability of *Amaranthus blitum* make it an important harmful weed in agricultural crops [6]. Consequently, the application of integrated agrotechnical and mechanical control measures against this species is necessary.



Figure 1. *Portulaca oleracea* L. (common purslane)

It is an annual spring weed that is widely distributed in crop fields and gardens. Its stem is fleshy, succulent, prostrate, and strongly branched, reaching a height of 10–30 cm. The leaves are thick, flat-elongated, and arranged alternately or, in the upper part, oppositely. The flowers are small, yellow in color, and are formed singly or in groups of 1–3 in the leaf axils. The seeds are black

and glossy, and are capable of germinating from a soil depth of 2–8 cm [7]. The optimal germination temperature is 26–30°C, while the minimum is 8–10°C. The seeds can retain viability in the soil for up to 4 years. The plant flowers from June to August and produces seeds in September.



Figure 2. *Capsella perfoliata* (perfoliate pennycress)

is an annual weed with a bluish, glabrous (non-pubescent) appearance. Its stem is erect, sometimes sparsely branched, reaching a height of 15–40 cm. The leaves have smooth margins; the lower leaves are obovate-lanceolate and obtuse in shape. The inflorescences are relatively loose but develop in a moderately compact flowering structure. The siliques are elongated and approximately twice as long as the calyx, which is a distinguishing feature of the species. The plant flowers from April to June, and the seeds mature within this period. It is mainly found in orchards and between irrigated crop fields [8]. Its distribution includes the Tashkent and Samarkand regions.

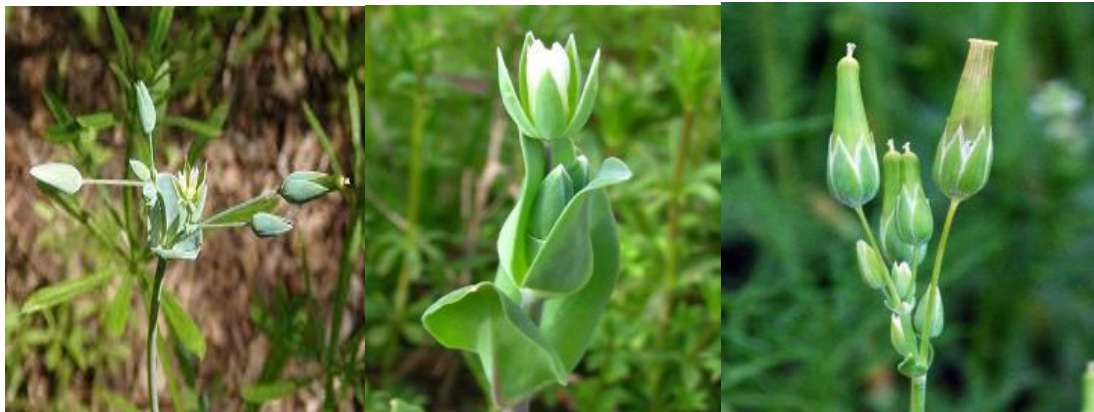


Figure 3. *Chenopodium glaucum* (glaucous goosefoot, maria)

is an annual weed widely distributed in agro-phytocenoses. Its stem is erect or partially ascending, highly branched, and reaches a height of 5–75 cm. The leaves are petiolate, elongated, sometimes ovate or ovate-elliptic in shape, with an obtuse apex, cuneate base, and coarsely toothed margins. The flowers develop in a triadic structure. The seeds are highly viable and can retain their germination capacity in the soil for up to 10 years. The plant flowers in May–June and produces seeds during the same period. It is mainly found as a weed in crop fields and is widely distributed in the Tashkent, Samarkand, and Fergana regions [9].



Figure 4. *Brassica campestris* (wild mustard, wild cabbage)

is an annual weed widely distributed among vegetable and melon crops. Its stem is erect, reaching a height of 20–100 cm. The lower leaves are lyrate and pinnately divided, forming a strong leaf mass during the vegetative stage. The seeds are reddish-brown and rich in oil content. The siliques are 3–8 cm long and have a beak-like projection at the apex. A single plant can produce up to 20,000 seeds on average, indicating its high reproductive potential. The minimum temperature required for seed germination is 3–4°C, and seeds are capable of germinating from a soil depth of 4–5 cm. The plant flowers from April to June and produces seeds during the same period. This species is a strong competitive weed in crop fields and is widely distributed across all regions of Uzbekistan [10].



Figure 5. *Brassica elongata* (long-stalked mustard)

is an annual weed widely distributed in cultivated fields. Its stem is erect, branched, and glabrous, reaching a height of 20–100 cm. The lower leaves are lyrate and pinnately divided, and they do not fully clasp the stem at the base. The flowers are yellow and arranged in raceme-type inflorescences. The seeds are dark brown to black in color. The siliques are 2.5–5 cm long and terminate in a slender beak-like tip. A single plant can produce an average of up to 20,000 seeds, indicating its high reproductive capacity. The minimum temperature required for seed germination is 3–4°C, while the optimal temperature is 20–24°C. Seeds are capable of germinating from a soil depth of 4–5 cm. The plant flowers from April to June and produces seeds during the same period.

This species occurs as a weed among crops and is found in the Republic of Karakalpakstan, Tashkent, Khorezm, Samarkand, and Jizzakh regions [11].



Figure 6. *Cardaria pubescens* (hairy tumble mustard)

is a perennial weed mainly found in saline soils and cultivated fields of foothill (adyr) regions. Its stem is erect, branched in the upper part, and reaches a height of about 20–30 cm. The leaves are covered with short, dense fine hairs and have a broadly lanceolate shape. This pubescent structure increases the plant's adaptation to drought and salinity conditions. The plant flowers in April–May and produces seeds during the same period. It predominantly develops as a weed in saline soils and among crops. This species is distributed in the Republic of Karakalpakstan, Tashkent region, the Fergana Valley, and Khorezm region [12].



Figure 7. *Capsella bursa-pastoris* (shepherd's purse)

is an annual weed widely distributed in agro-phytocenoses. Its stem is simple or branched, glabrous or sparsely pubescent, reaching a height of 10–50 cm. The lower leaves are pinnately lobed, petiolate, and have lanceolate margins, whereas the stem leaves are smaller, sessile, and arranged alternately. The flowers are white and develop in raceme-type inflorescences. A single plant can produce on average from 1,200 to 73,000 seeds, indicating a very high reproductive potential. The minimum temperature for seed germination is 1–2°C, while the optimum is 15–26°C. Seeds are capable of germinating from depths of up to 3 cm and can retain viability for up to 5 years. The plant flowers from April to May and produces seeds during the same period. It is mainly found in orchards and crop fields and is widely distributed throughout Uzbekistan [13].



Figure 8. *Leptaleum filifolium*

is an annual weed widely distributed in desert and foothill (adyr) zones, as well as in cultivated fields. Its stem is mainly branched from the base, simple or bifurcated, covered with hairs, and reaches a height of 2–20 cm. The leaves are petiolate, glabrous, and very narrow, filiform in shape, with entire or partially pinnatifid margins. The flowers are located on almost all parts of the plant, forming a loose inflorescence structure. The seeds are arranged in two rows, yellow in color, oval-shaped, and very small (about 1.5 mm in length and 0.6 mm in width) [14]. The plant flowers from March to May and produces seeds during this period. This species occurs as a weed in desert and foothill areas as well as among crops and is widely distributed across all regions of Uzbekistan.



Figure 9. *Raphanus raphanistrum* (wild radish)

is an annual weed widely distributed in rainfed and irrigated crop fields. Its stem is strongly branched, ribbed, and covered with fine hairs, reaching a height of up to 60 cm. The leaves are shortly petiolate and consist of spreading lobes, and they develop well during the vegetative stage. The plant reproduces mainly by seeds. The flowers are pale yellow and bloom from May to June, during which seed formation also occurs. This species occurs as a weed among crops and is widely distributed across all regions of Uzbekistan [15].



Figure 10. *Malva neglecta* (dwarf mallow, common mallow)

is an annual weed widely distributed in irrigated crop fields. Its stem is prostrate or partially ascending, branched, and reaches a height of about 25–30 cm. The leaves are long-petiolate, rounded in shape, and form a well-developed vegetative mass. The flowers are pink in color and are mainly located in the leaf axils. The plant reproduces by seeds. A single plant can produce an average of up to 59,500 seeds, indicating a very high reproductive capacity. Seeds are capable of germinating from depths of 6–8 cm and can retain viability for up to 5 years. The plant flowers from April to September and produces seeds during the same period. It occurs as a weed in irrigated crops and is widely distributed throughout all regions of Uzbekistan.

***Hibiscus trionum* (Venice mallow, bladder ketmia)** is an annual weed mainly found among cotton and melon crops. Its stem is erect, branched, and reaches a height of 15–60 cm. The leaves are deeply divided to the base, elongated, and consist of pinnately lobed segments. The flowers are borne singly on long pedicels. The seeds are dark brown, kidney-shaped, and small in size. The capsule is short-pedunculate. A single plant produces on average up to 15,000 seeds. The minimum temperature required for seed germination is 5–6°C, and seeds are capable of germinating from depths of 6–8 cm. One of its most important biological characteristics is the ability of its seeds to retain viability for up to 50 years. The plant flowers from June to September and produces seeds during the same period. It mainly develops as a weed in cotton fields and partly in melon crops, and is distributed throughout all regions of Uzbekistan.





Figure 11. Plants of the Malvaceae Family: Flowers, Fruits, and Seed Structures

Conclusion.

Annual dicotyledonous weeds occurring in peanut (*Arachis hypogaea*) agroecosystems are characterized by high biological adaptability, intensive generative development, and high seed productivity. These traits enable their persistent survival in cultivated fields and contribute to their rapid spread.

The analysis shows that these weed species establish strong phytocompetition with peanut crops for essential resources, including nutrients, soil moisture, and light. As a result, vegetative growth of the crop is suppressed, the transition to the generative stage is delayed, and overall yield performance is significantly reduced.

From this perspective, limiting the population of annual dicotyledonous weeds in peanut agroecosystems and reducing their negative impact requires the application of an integrated weed management system. The combined use of agrotechnical, mechanical, and, when necessary, chemical control methods represents a scientifically justified and practically effective approach.

References

- [1] N. M. Turdiyeva and O. X. Mustafaeva, "Distribution and control methods of weeds in crop fields," *Journal of Agrochemistry and Plant Protection*, no. 3, pp. 45–49, 2021.
- [2] R. L. Zimdahl, *Fundamentals of Weed Science*, 4th ed. San Diego, CA, USA: Academic Press, 2018.
- [3] L. J. King, I. M. Holm, J. V. Pancho, and J. P. Herberger, *World Weeds: Natural Histories and Distribution*. New York, NY, USA: Wiley, 1997.
- [4] L. Holm, J. Doll, E. Holm, J. Pancho, and J. Herberger, *World Weeds: Natural Histories and Distribution*. New York, NY, USA: Wiley, 1997.
- [5] R. S. Radosevich, J. S. Holt, and C. M. Ghersa, *Weed Ecology: Implications for Management*, 2nd ed. Hoboken, NJ, USA: Wiley, 2007.
- [6] R. H. Ross and J. F. Lembi, *Applied Weed Science: Including the Ecology and Management of Invasive Plants*, 3rd ed. Upper Saddle River, NJ, USA: Pearson, 2009.

- [7] A. Sh. Khan and M. Ahmad, "Weed management practices in peanut (*Arachis hypogaea* L.) cultivation," *Agricultural Sciences Journal*, vol. 12, no. 2, pp. 101–108, 2019.
- [8] F. Labrada, "Weed management for developing countries," FAO Plant Production and Protection Paper, Rome, Italy, 2003.
- [9] A. C. Murphy, *Weeds of Southern United States and Their Control*. Baton Rouge, LA, USA: Louisiana State University Press, 2008.
- [10] H. D. Coble and D. L. Mortensen, "Weed management systems in agricultural crops," *Weed Science*, vol. 45, no. 3, pp. 347–356, 1997.
- [11] R. J. Aldrich, *Weed-Crop Ecology: Principles in Weed Management*. Northampton, MA, USA: Science Publishers, 1997.
- [12] E. R. Oerke, "Crop losses to weeds in major agricultural crops," *Agriculture, Ecosystems & Environment*, vol. 83, no. 1–2, pp. 105–118, 2001.
- [13] J. H. Boutwell and J. B. Beard, "Ecological approaches to weed control in crop systems," *Agronomy Journal*, vol. 92, no. 4, pp. 512–518, 2000.
- [14] A. H. Khan, "Integrated weed management strategies in field crops," *Journal of Plant Protection Research*, vol. 55, no. 4, pp. 401–407, 2015.
- [15] G. Z. Labrada and C. Parker, *Weed Management for Developing Countries*. Rome, Italy: FAO, 2002.