

The Impact of the Improved Genetic Material to the Economic Value of Plake Fasoli Prespon PGI Product [†]

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Abstract: The project aims to safeguard this local variety by comprehensively studying its genetic variability. Furthermore, it seeks to follow official protocols for the description and subsequent registration of the variety in the National List of Varieties, increasing the product's value and securing its identity. Experimentation targets evaluation of the landrace to select plants with improved productivity and quality. The profit from implementing the program will come from a combination of higher productivity due to the use of improved genetic material, improved consulting services related to agricultural techniques, and increased values due to higher prices due to authenticating the product. This initiative aspires to provide benefits for the Agricultural Cooperative of Bean producers of the Prespes area. At the same time, the farmers will be trained for good seed reproduction and production of the landrace.

Keywords: Plake Fasoli Prespon; PGI; local landrace; added value



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1. Introduction

In Greece, beans assume a central role among pulse crops, forming the cornerstone of the traditional Mediterranean diet. Over recent years, the cultivated area dedicated to beans has seen a noticeable expansion [1]. The common bean enjoys a prestigious status as a globally esteemed legume, offering a substantial source of high-quality proteins, carbohydrates, vitamins, minerals, dietary fiber, phytonutrients, and antioxidants, all vital for human nutrition. These components have been recognized for their significant positive impacts on human health. Consequently, the common bean holds promise as a valuable functional food [2,3]. These beans are typically grown for their dried seeds during the spring and summer seasons.

The primary region for their cultivation is located in northern Greece, particularly in areas characterized by relatively high altitudes and cool climatic conditions like Prespa area. Belonging to the Fabaceae family, common beans and lathyrus both play essential roles in promoting sustainable agriculture due to their ability to fix atmospheric nitrogen. This capability reduces the need for excessive fertilizer applications, contributing to environmentally friendly farming practices.

The designation of Plake Fasoli Prespon as a Protected Geographical Indication (PGI) product does not provide protection for the cultivated genetic material because it is not registered as a traditional cultivar in the National Catalog of Varieties [EC 2008/62/EK (official Greek Gazette) FEK 165/30-01-2014]. This oversight contributes to the erosion of the variety's genetic diversity, with the associated risks of losing its distinct identity, reduced yields, and compromised quality. The project's (M16SYN2-00181) primary objective is to safeguard this local variety by comprehensively studying its genetic variability. Furthermore, it aims to follow official protocols for the description and subsequent registration of the variety in the National List of Varieties, which will increase the value of the product and secure its identity.

2. Material and Methods

Three research Institutions (ELGO-Dimitra, University of Western Macedonia, and International Hellenic University), the local Agricultural Community represented by the Agricultural Cooperative of Florina "Pelekanos", an NGO Aegilops, and an Advisor (Tsipi Anthoula) are cooperating under the PAA M16.1–16.2 project (M16SYN2-00181) to achieve this goal. The project's first-year inception phase revolved around the examination of genetic diversity within landraces. The primary objective was to identify plants that exhibited enhanced productivity and quality while retaining all the essential plant characteristics required for product production. To facilitate this research, the genetic materials utilized were seeds from "Fasoli Prespon", sourced from the "Pelekanos" Agriculture cooperative. The experiment was conducted during the 2022–2023 growing season and was carried out at the University of Western Macedonia-Department of Agriculture's farm, as illustrated in Figure 1. A total of 600 plant positions were established for each landrace in low plant density. All observations were made at the individual plant level and pertained to a range of agronomic and physiological traits.



Figure 1. Field experiment of common bean in low plant density.

3. Results and Discussion

The designation of Plake Fasoli Prespon as a Protected Geographical Indication (PGI) product does not provide protection for the cultivated genetic material because it is not registered as a traditional cultivar in the National Catalog of Varieties [EC 2008/62/EK (official Greek Gazette) FEK 165/30-01-2014]. This oversight contributes to the erosion of the variety's genetic diversity, with the associated risks of losing its distinct identity, reduced yields, and compromised quality. Following the primary objective of this project,

e.g., the study of genetic variability, it was found that yield ranged from 50 to 500 g per plant, the number of pods from 30 to 400 per plant, flowering began from 48 to 63 days from sowing and continued to the end of growing season. Similar variability was found for physiological characteristics of chlorophyll and photosynthesis measurements.

The cultivation in question is of great importance to the local agricultural community in Prespes area, making a substantial contribution to the local economy. It is estimated that Plake Fasoli Prespon is cultivated on ~300 ha, with a yield of 3000 Kg/ha. and price of ~2.8 €/Kg, respectively, with an essential economic contribution (2.52 million) to the local Agricultural community of Western Macedonia. The expected advantages of implementing this program are estimated to result in a crucial annual profit. This boost in profit will be the outcome of several factors, including enhanced productivity resulting from the use of improved genetic materials, more effective consulting services, and an increased market value due to the verified origin and quality of the product.

4. Conclusions

This work will present the parameters connected with the description of the unique identity of this product, its origin, traceability, local agricultural practices, and specific product characteristics that will contribute to this. The product will be utilized by the Agricultural Cooperative of Florina, and at the same time, the farmers will be trained for the good seed reproduction and production of the product. This initiative promises several benefits for the Agricultural cooperative and producers of the Prespes area.

The comprehensive strategy of project M16SYN2-00181, funded within the framework of the Agricultural Development Program 2014–2020 (under Measure 16), with a specific focus on Sub-Measure 16.1–16.2, is designed to significantly enhance the preservation and effective utilization of a valuable agricultural resource. This endeavor involves a multi-faceted approach that encompasses the following key actions:

1. **Registration and Identification:** The project will diligently describe and identify the landrace, ensuring compliance with the latest legislative guidelines and EU directives. A meticulous description protocol will be employed for this purpose.
2. **Protected Variety Designation:** A crucial step involves officially designating the landrace as a protected variety and initiating the process of its registration in the National List of Varieties.
3. **Innovative Conservation and Seed Production:** The project will pioneer an innovative framework and process for disseminating best practices in conservation and seed production within the landrace's region of origin. This initiative will ensure the preservation of the landrace and guarantee certification and seed purity. Collaboration with "Pelekanos" Agricultural cooperation and the valuable support of researchers from esteemed research institutes and Agricultural Universities will be instrumental in this effort.
4. **Authentication:** The project will employ a rigorous approach to authenticate the landrace. This will involve a detailed examination of morphological and qualitative characteristics and advanced DNA techniques to establish and confirm the landrace's unique identity.
5. **Consulting Services for Farmers:** The project is dedicated to providing consulting services to improve farming techniques among local farmers. This will encompass a range of educational methods, including field schools, e-learning opportunities, user-friendly online applications, and the creation of a supportive online networking platform.
6. **Reduced Input Documentation:** The project will diligently document and demonstrate the reduction in product inputs as a result of the implemented measures, showcasing the economic and environmental benefits of the program.

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