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Evaluation of Local Pepper Varieties for Fruit Productivity and Nutritional Value under Low-Input Conditions

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Abstract

Traditional pepper varieties (Capsicum annuum L.) are of great importance for biodiversity conservation and the enhancement of agricultural production. Traditional varieties are often better adapted to local climatic conditions and soils, offering resistance to diseases and environmental stresses that hybrids do not always provide. Additionally, traditional varieties contribute to preserving flavor and nutritional quality as they have evolved based on the needs and preferences of local communities. With its shifting conditions, climate change intensifies the need to develop varieties that are resilient to low inputs. Cultivating traditional pepper varieties with enhanced resilience to low-input conditions is crucial for ensuring productivity and food security, especially in vulnerable regions. Furthermore, strengthening these varieties through evaluation and subsequent improvement can offer significant solutions in a changing climate, promoting pepper crops' adaptability and long-term sustainability.

This study was conducted at the Hellenic Agricultural Organization-DIMITRA Farm in Thermi in 2024. Twenty-five traditional pepper varieties were grown using a completely randomized block design (3 blocks with 10 plants per block) in an unheated open greenhouse under low-input cultivation conditions. Their evaluation and characterization followed, focusing on descriptive traits, yield (early and total), and post-harvest quality characteristics such as nutritional value and antioxidants. Genetic materials that demonstrate superiority in yield (e.g., the variety ‘Kampanoula’) or fruit biochemical characteristics (e.g., the variety ‘Filuria’ for phenolic content and ascorbic acid at commercial maturity) can be utilized in cultivation or incorporated into breeding programs aimed at developing Greek varieties or hybrids that are resilient to low inputs while providing exceptional fruit nutritional value.

Keywords: biodiversity; Capsicum annuum; fruit quality; yield