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Evaluation of Pimiento Blanco Cultivars (Capsicum annum L.) from Villena under organic farming conditions.

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<https://2023.agricultureforlife.usamv.ro/>**RESUMEN/ABSTRACT:**

THE INTERNATIONAL CONFERENCE
"AGRICULTURE FOR LIFE, LIFE FOR AGRICULTURE"

**EVALUATION OF PIMIENTO BLANCO CULTIVARS
(*CAPSICUM ANNUUM L.*) FROM VILLENA
UNDER ORGANIC CONDITIONS**

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Abstract

The Capsicum Team of COMAV Institute has been collaborating with farmers from Villena (Spain) to evaluate and recover a kind of wax pepper that is highly valued in the area. Thereby, five accessions of the "Pimiento Blanco", preserved by farmers from Villena (B_1, M_1, S_1, S_2, Z_1) have been evaluated and compared to commercial hybrids under organic farming management. Vitamin C, fructose, glucose and luteolin contents were measured using HPLC, as well as the yield per plant. Vitamin C levels were significantly higher in B_1 compared to F1 hybrids. Moreover, M_1 showed statistically higher fructose and glucose levels respect to commercial hybrids. Also, luteolin was statistically higher in Z_1 in comparison with the commercial cultivars. Finally, yield per plant did not show remarkable differences between genotypes. These results show the potential of these local materials to be used under low input conditions and to increase the biodiversity of our agrifood sector. Thanks to the grant CIPROM/2021/020 (GVA), the AGROALNEXT programme (AGROALNEXT/2022/027, GVA), MCIN (NextGenerationEU, PRTR-C17.11) and the grant of M. Jiménez (M.Universities, FPU20/03486).

Key words: luteolin, organic farming, sugars, vitamin C, wax peppers.



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EVALUATION OF PIMIENTO BLANCO CULTIVARS (CAPSICUM ANNUM L.) FROM VILLENA UNDER ORGANIC CONDITIONS

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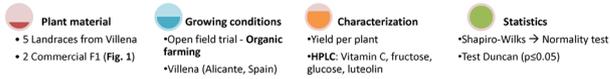
INTRODUCTION

The promotion, preservation and improvement of numerous traditional Spanish horticultural cultivars, among other cultivars from different countries, is the main goal of the Institute for the Preservation and Improvement of Valencian Agrobiodiversity (COMAV Institute, Valencia, Spain). The "Pimiento Blanco" from Villena (Alicante, Spain) is a kind of wax pepper highly valued and consumed in the region, preserved and selected by farmers for hundreds of years. In this regard, The Capsicum Team, in collaboration with farmers and technicians from the farmers' Cooperative "Agrícola Villena", has evaluated and selected a multitude of Pimiento Blanco ecotypes, and has compared them with commercial varieties and ecotypes from other regions of Spain. After more than three years of evaluation, this work shows the preliminary results of the best genotypes. The yield per plant, as well as the fructose, glucose, vitamin C and the flavonoid luteolin levels were evaluated by HPLC analysis in five accessions maintained by farmers from Villena (B_1, M_1, S_1, S_2 and Z_1) and two commercial hybrids, that were cultivated under organic farming conditions.

MATERIALS AND METHODS



Figure 1. A) B_1, B) M_1, C) S_1, D) S_2, E) Z_1, F) Skytia F1.



RESULTS AND DISCUSSION

No statistical differences in yield per plant were detected between landraces and commercial hybrids, showing the good adaptation of the local ecotypes to that specific agroclimatic conditions and management from Villena's technicians with respect to the F1 hybrids (Fig. 2A).

Related to the internal composition, vitamin C levels varied between 728 in Z_1 and 1148 mg/kg fresh weight (fw) in B_1 (Fig. 2B), being higher compared to the results reported by Pérez-López et al., (2007) in immature peppers under organic management. The ecotype B_1 had statistically higher vitamin C levels compared to F1 hybrids (Fig. 2B). In the case of sugars, the lower fructose and glucose contents were measured in Skytia F1, with 8.34 and 9.09 g/kg fw, respectively, whereas M_1 was the ecotype with the greatest sugar profile, showing 11.05 of fructose and 12.99 g/kg fw of glucose levels (Fig. 2C-D). Glucose content in M_1 was also statistically higher respect to both hybrids (Fig. 2C-D). These results were similar to those showed by Denev et al., (2019) in green peppers. Finally, respect to the luteolin profile, luteolin varied between 74 and 139 µg/g dry weight (dw) in Cynthia F1 and Z_1, respectively (Fig. 2E). These luteolin levels were lower to those reported by Chassy et al., (2006) in unripe bell peppers under organic conditions. On the other hand, the local ecotype Z_1 showed statistically higher luteolin levels compared to the commercial hybrids, as well as M_1, S_1, S_2 and Z_1 had also significantly higher contents of this flavonoid (Fig. 2E).

CONCLUSIONS

- ✓The absence of differences in yield between genotypes showed the agronomic potential of the local ecotypes respect to commercial hybrids in the tested organic conditions.
- ✓The evaluated quality traits showed significant differences between local ecotypes.
- ✓B_1 was the genotype with the highest vitamin C levels, highlighting statistically over the two commercial hybrids.
- ✓Sugar profile was significantly higher in M_1 respect to both F1 hybrids.
- ✓Luteolin content was statistically higher in Z_1 compared to the commercial hybrids.

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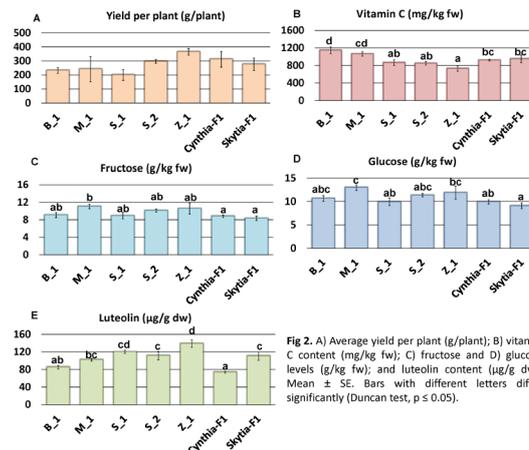


Fig 2. A) Average yield per plant (g/plant); B) vitamin C content (mg/kg fw); C) fructose and D) glucose levels (g/kg fw); and E) luteolin content (µg/g dw). Mean ± SE. Bars with different letters differ significantly (Duncan test, p ≤ 0.05).

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