

# TREATMENT WITH SELECTED PSEUDOMONAS STRAINS PROVOKES GENOTYPE-DEPENDANT RESPONSE OF SIX SWEET PEPPER CULTIVARS TO DROUGHT

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The effect of 11 *Pseudomonas* spp. strains isolated from rhizosphere (eight strains) and phyllosphere (three) on response of six (261, 268, 274, Una, Matica, and Kurtovska Kapija) pepper genotypes to water deficiency was examined. PCR-based analysis of *phcA* (phenazine), *prnD* (pyrrolnitrin) and *pltC* (pyoluteorin) genes revealed their presence in all selected strains, while more than one gene was detected in *P. chlororaphis* Bo, *P. synxantha* P4\_16/1, *P. orientalis* R3\_16/1, *P. fluorescens* ČL5, *P. putida* P2, and *P. vranovensis* P3 strains (Table 1). Pepper seeds with (treated) or without (controls) bacterial strains were planted in pots. After four weeks of growth, drought was imposed by completely withholding water for one week. The relative water content (RWC) (Table 2), H<sub>2</sub>O<sub>2</sub> production, lipid peroxidation (MDA), and proline production were determined.

Table 1. PCR products for *phcA*, *prnD* and *pltC* genes in analyzed *Pseudomonas* spp. strains.

Strains	Genes		
	<i>phcA</i>	<i>prnD</i>	<i>pltC</i>
Bo	+	+	+
P4_16/1	+	+	+
R3_16/1	-	+	+
ČL5	-	+	+
P1	-	-	+
P2	-	+	+
P3	-	+	+
P4	-	+	-
P5	-	+	-

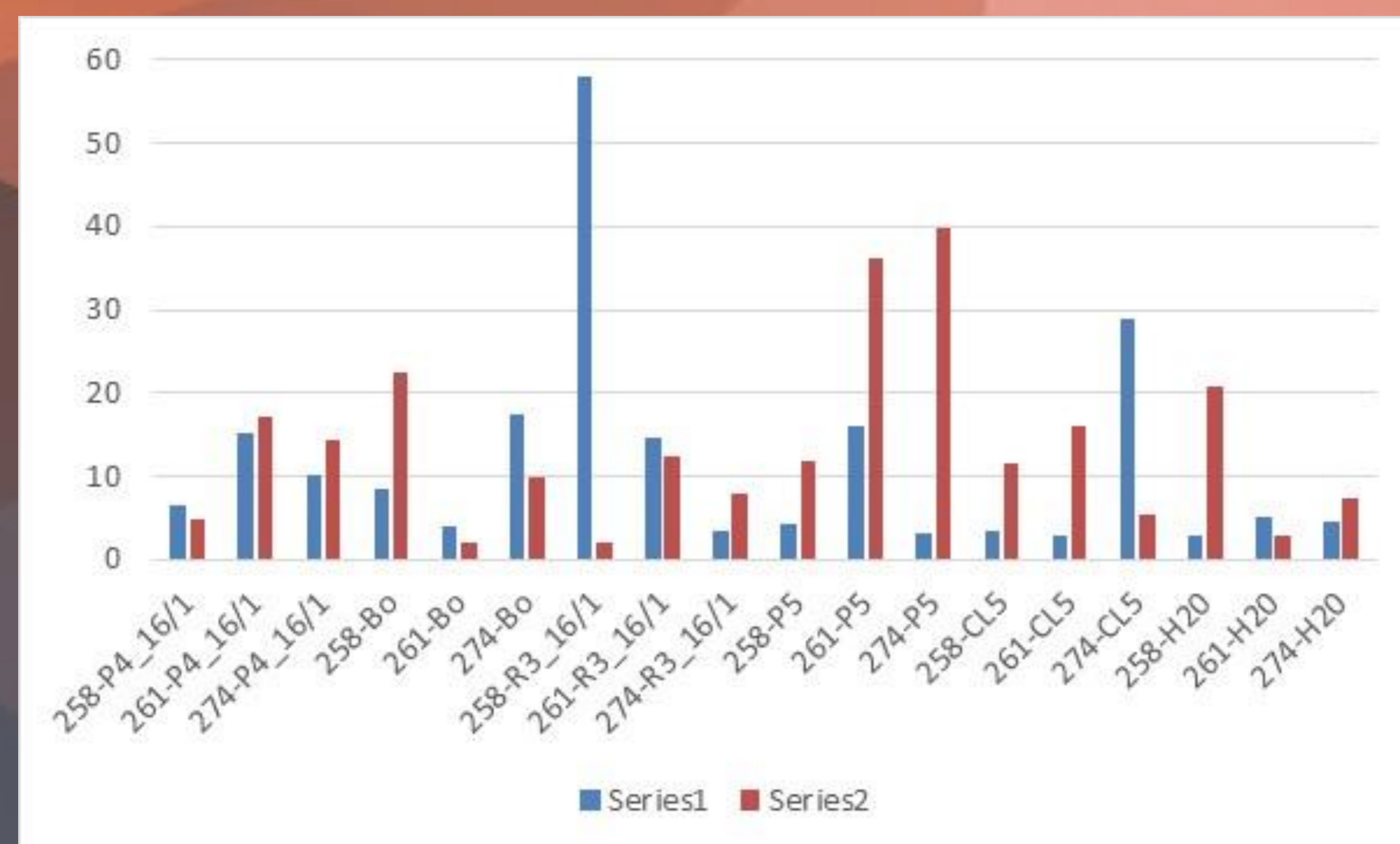


Fig. 1. H<sub>2</sub>O<sub>2</sub> content in normal and drought conditions in 258, 261 and 274 genotypes treated with P4\_16/1, Bo, R3\_16/1, P5, ČL5. H<sub>2</sub>O is control.

Significantly decreased H<sub>2</sub>O<sub>2</sub> content under drought conditions was observed in genotypes 258 after treatment with P4\_16/1, R3\_16/1, 261 after treatment with Bo, R3\_16/1 and 274 after treatment with Bo, ČL5 (Fig. 1). Additionally, for the same genotypes decreased of MDA content was observed after bacterial treatment (258 – P4\_16/1, 261-P4\_16/1, R3\_16/1, 274-Bo), Fig. 2.

Increase in proline production under drought conditions was observed after treatment of two genotypes, 261 after treatment with ČL5 and 274 after treatment with P4\_16/1, R3\_16/1 and ČL5 strains (Fig. 3).

Table 2. Effect of treatment on different pepper genotypes under water deficiency conditions

Pepper genotype	RWC decreased	RWC increased	RWC did not change
258	P4_16/1	2.7, R3_16/1, P5, ČL5	-----
261	Bo, R3_16/1	2.7, ČL5	-----
274	2.7, P4_16/1	Bo, R3_16/1	H <sub>2</sub> O
Matica	P4_16/1	R3_16/1, P5	2.7, Bo, ČL5
Una	2.7, P4_16/1, Bo, P5, R3_16/1, ČL5	-----	-----
K.K.	R3_16/1	2.7, P4_16/1, P5	ČL5

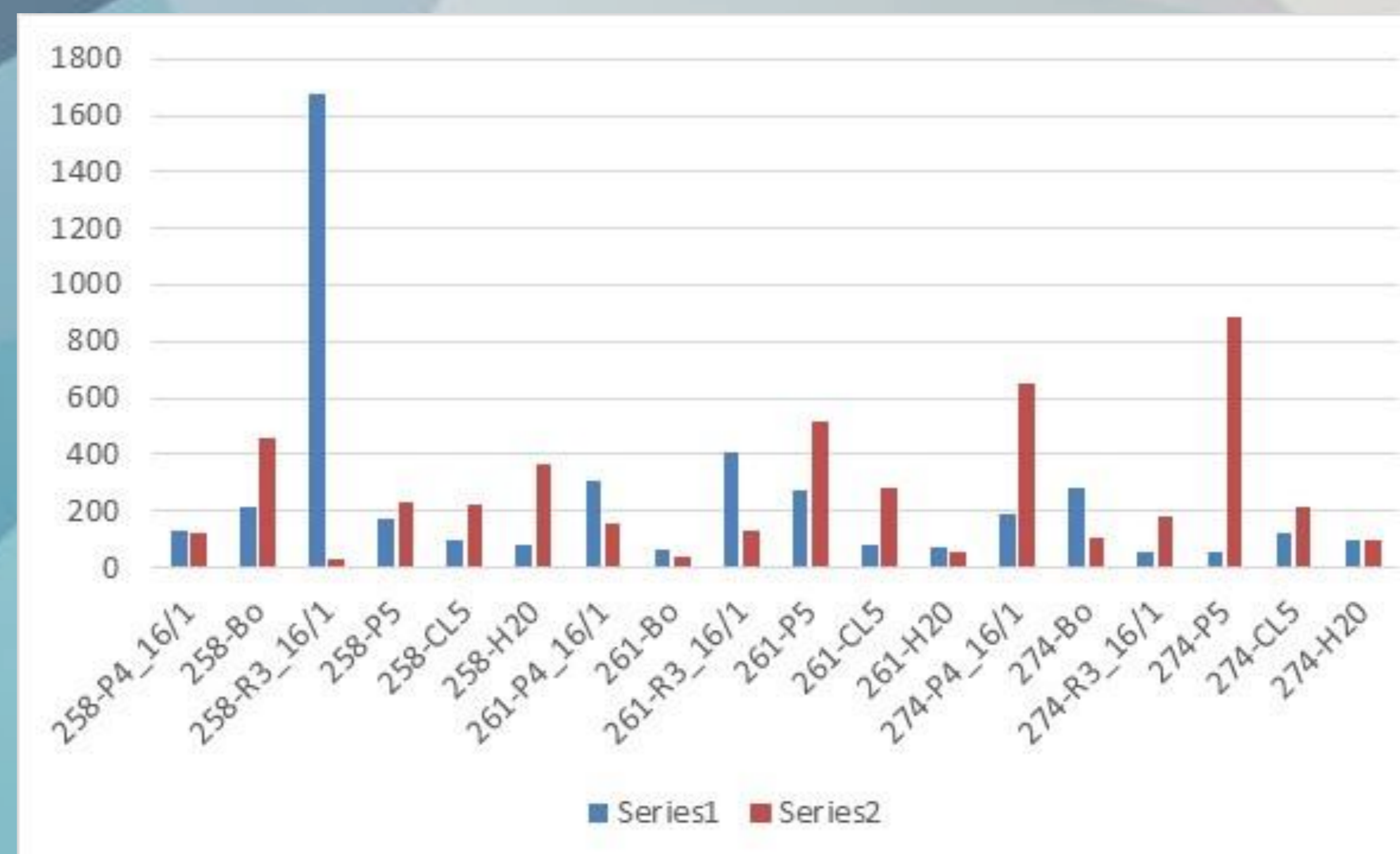


Fig. 2. MDA content in normal and drought conditions in 258, 261 and 274 genotypes treated with P4\_16/1, Bo, R3\_16/1, P5, ČL5. H<sub>2</sub>O is control.

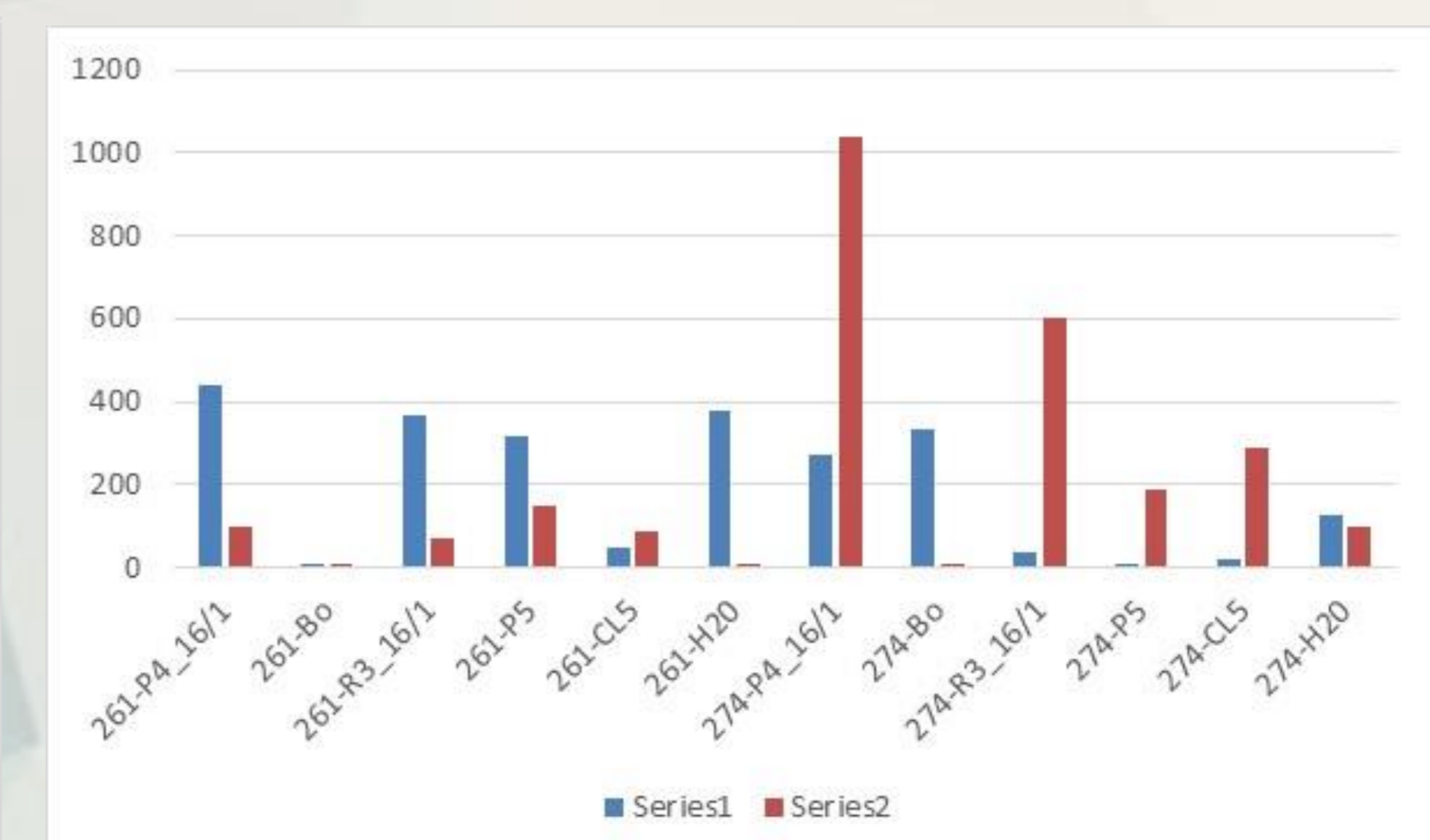


Fig. 3. Proline production in normal and drought conditions in 261 and 274 genotypes treated with P4\_16/1, Bo, R3\_16/1, P5, ČL5. H<sub>2</sub>O is control.

## Conclusion:

- The Una genotype showed increased stress intensity in treatment with all selected strains, which indicates the exceptional sensitivity of this genotype to drought.
- It was observed that strains P4\_16/1, R3\_16/1, and ČL5, isolates from phyllosphere provoke a decrease in the intensity of lipid peroxidation, RWC and proline production, respectively in most genotypes, compared to other strains analyzed here.
- According to obtained results, we could conclude that there is a relationship between plant response to an abiotic factor (drought) and biotic factor (bacteria).