

EVALUATION OF THE BUJORUL VARIETY AGAINST DOWNY MILDEW AND POWDERY MILDEW ATTACK, COMPARED TO THE MOST CULTIVATED VARIETIES OF TABLE GRAPES IN TIMIȘ COUNTY

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Abstract: *The Bujorul grape variety is a relatively recent variety created in Galați, which has very good organoleptic qualities, but it is not a well-known variety, and its expansion in culture is low. The present article aims to bring some clarifications regarding the resistance of the Bujorul variety to downy mildew and powdery mildew, the most widespread fungal diseases that affect the foliage of vines every year of cultivation. In the article, the effects of manna and powdery mildew on the Bujorul variety are compared with the attack of these fungi on other popular grape varieties, such as the Nero, Victoria, Muscat Hamburg, Moldova and Chasselas doré varieties. The research was done in 2022, in a private collection of table grape varieties located in Timiș County, in Urseni village. The year 2022, thanks to the water and temperature regime, influenced predominantly the powdery mildew attack than the downy mildew attack. The obtained results were interpreted statistically and comparisons were made with each variety, in order to get an overview of the influence of the climate on the attack of these diseases on the Peony variety compared to the other varieties, on which a lot of research has been done in different areas of the country regarding their response to the attack. In the paper, we tabulate only the degree of disease attack and graphically illustrate the obtained data.*

Keywords: *grapevine downy mildew, powdery mildew, Bujorul variety*

INTRODUCTION

Grapevine downy mildew (ELLIS MICHAEL, 2016 a; ASH, 2000) and powdery mildew (POPESCU, 1989, 1998; BAICU & SESAN, 1996; ELLIS MICHAEL, 2016 b; ȘTEF, 2018) are the most important diseases of this species, which almost every year do large harvest losses, mainly due to the reduction of the photosynthetic surface of the grapevine leaves (VULPEȘ & GHEORGHIES, 1982; PUIA, 2006; UDGAVE et al., 2011; WILCOX et al., 2015). The main factor in the spread of these diseases is the water, in the form of rainwater and dew (especially in downy mildew), but also as relative humidity of the air (ALEXANDRI et al., 1972; KOCH & HURLE, 1978; OȘLOBEANU et al., 1978, 1980; MOLNAR, 2003).

The year 2022 was a dry year, which made these diseases appear late, towards in the middle of September. The Bujorul grapevine variety is a variety intended for fresh consumption, characterized by medium-sized, yellowish-pink, aromatic berries. It is a relatively recent variety created in Galați, and this variety spread is low and is almost unresearched variety, especially in the western part of Romania (DRĂGANESCU & MIHACEA, 1993; COTEA & COTEA, 1996). The paucity of data about this variety, led us to carry out this research.

MATERIAL AND METHODS

The research was done in a vineyard in Urseni, Timiș County, located in the metropolitan area of Timișoara.

In addition to the Bujorul grape variety, we compared five other table grape varieties; Nero, Victoria, Muscat Hamburg, Moldova and Chasselas dore.

The varieties were the variant of the experiment, from each variant was made in three repetitions, and each repetition contained five plants (SUCIU et al., 1988). Each plant was fully studied with regard to the frequency and intensity of the attack of downy mildew and powdery mildew and finally the degree of attack of these diseases was calculated. The experimental data was interpreted statistically and differences were made between each variety.

RESULTS AND DISCUSSION

In this sub-chapter we will present the experimental data of frequency, intensity and the degree of attack of the grapevine downy mildew and grapevine powdery mildew, taking the diseases as benchmarks.

Grapevine downy mildew results

Table 1 shows the comparative data between the varieties, about attack frequency (F%) of grapevine downy mildew as a result of the statistical analysis.

Table 1

Grapevine downy mildew frequency (F%) compared between varieties

	Nero	Victoria	Muscat Hamburg	Bujorul	Moldova	Chasselas dore
Nero	-	-14.95 ⁰⁰⁰	-12.18 ⁰⁰⁰	-8.41 ⁰⁰⁰	5.41 ^{***}	-3.65 ⁰⁰
Victoria	14.95 ^{***}	-	2.77 [*]	6.54 ^{***}	20.36 ^{***}	11.30 ^{***}
Muscat Hamburg	12.18 ^{***}	-2.77 ⁰	-	3.77 ^{**}	17.59 ^{***}	8.53 ^{***}
Bujorul	8.41 ^{***}	-6.54 ⁰⁰	-3.77 ⁰⁰	-	13.82 ^{***}	4.76 ⁰⁰⁰
Moldova	-5.41 ⁰⁰⁰	-20.36 ⁰⁰⁰	-17.59 ⁰⁰⁰	-13.82 ⁰⁰⁰	-	-9.06 ⁰⁰⁰
Chasselas dore	3.65 ^{**}	-11.30 ⁰⁰⁰	-8.53 ⁰⁰⁰	-4.76 ⁰⁰⁰	9.06 ^{***}	-

DL5% - 2.23; DL1% - 3.18; DL0.1% - 4.60

From the table we can be seen that, the Nero, Moldova and Chasselas dore varieties are more resistant to grapevine downy mildew, they showing very insignificant differences compared to the Bujorul variety. The Muscat Hamburg and Victoria varieties are more sensitive to the virulence of the fungus; the most sensitive is Victoria variety whose difference from the Bujorul variety is very significant (6.54).

Table 2 shows the comparative data between the varieties, about attack intensity (I%) of grapevine downy mildew as a result of the statistical analysis.

Table 2

Grapewine downy mildew attack intensity (I%) compared between varieties

	Nero	Victoria	Muscat Hamburg	Bujorul	Moldova	Chasselas dore
Nero	-	-12.73 ⁰⁰⁰	-9.00 ⁰⁰⁰	-6.73 ⁰⁰⁰	3.54 ^{**}	-3.90 ⁰⁰
Victoria	12.73 ^{***}	-	3.73 ^{**}	6.00 ^{***}	16.26 ^{***}	8.83 ^{***}
Muscat Hamburg	9.00 ^{***}	-3.73 ⁰⁰	-	2.27 ^{**}	12.54 ^{***}	5.10 ^{***}
Bujorul	6.73 ^{***}	-6.00 ⁰⁰⁰	-2.27 ⁰⁰	-	10.26 ^{***}	2.83 ^{**}
Moldova	-3.54 ⁰⁰⁰	-16.26 ⁰⁰⁰	-12.54 ⁰⁰⁰	-10.26 ⁰⁰⁰	-	-7.43 ⁰⁰⁰
Chasselas dore	3.90 ^{**}	-8.83 ⁰⁰⁰	-5.10 ⁰⁰⁰	-2.83 ⁰⁰	7.43 ^{***}	-

DL5% - 2.23; DL 1% - 3.17; DL 0.1% - 4.59

The most resistant varieties to grapevine downy mildew aggressivity are the Moldova and Nero varieties with a very insignificant statistical assurance compared to the Bujorul variety, and at the opposite pole, the most sensitive are the Victoria (6.00) and Muscat de Hamburg (2.27) varieties.

Table 3 and figure 1 shows the comparative data between the varieties, the degree of attack (Da%) of grapevine downy mildew as a result of the statistical analysis.

Table 3

Grapevine downy mildew degree of attack (Da%) compared between varieties

	Nero	Victoria	Muscat Hamburg	Bujorul	Moldova	Chasselas dore
Nero	-	-7.5 ⁰⁰⁰	-5.41 ⁰⁰⁰	-3.64 ⁰⁰⁰	1.63 ^{**}	-1.66 ⁰⁰
Victoria	7.50 ^{***}	-	2.09 ^{**}	3.86 ^{***}	9.13 ^{***}	5.84 ^{***}
Muscat Hamburg	5.41 ^{***}	-2.09 ⁰⁰	-	1.76 ^{**}	7.04 ^{***}	3.75 ^{***}
Bujorul	3.64 ^{**}	-3.86 ⁰⁰⁰	-1.76 ⁰⁰	-	5.27 ^{***}	1.99 ^{**}
Moldova	-1.63 ⁰⁰	-9.13 ⁰⁰⁰	-7.04 ⁰⁰⁰	-5.27 ⁰⁰⁰	-	-3.29 ⁰⁰⁰
Chasselas dore	1.66 ^{**}	-5.84 ⁰⁰⁰	-3.75 ⁰⁰⁰	-1.99 ⁰⁰	3.29 ^{***}	-

DL5% - 0.70; DL1% - 1.36; DL0.1% - 2.45

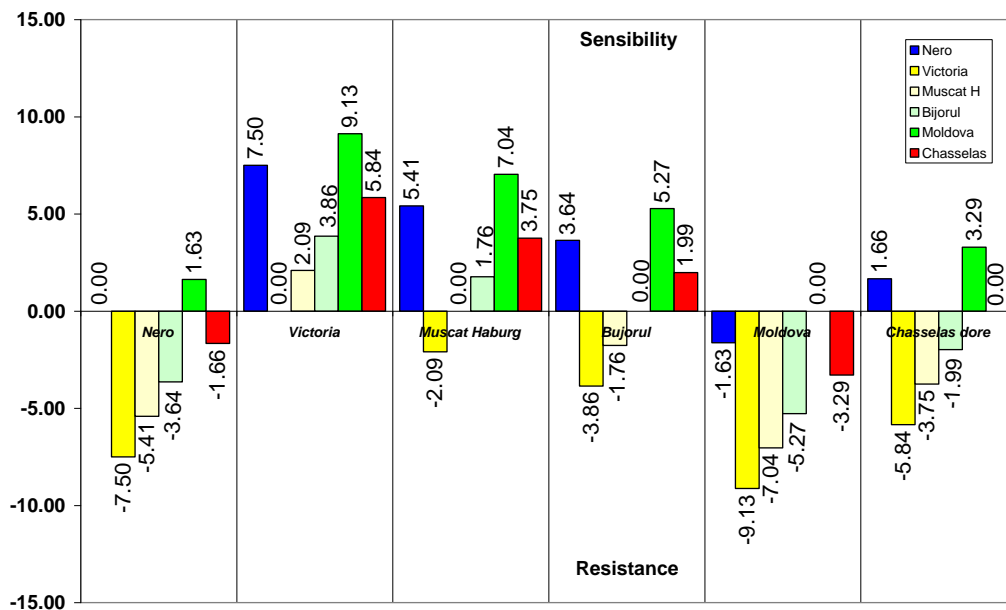


Figure 1. Illustration of grapevine downy mildew degree of attack (Da%) compared between varieties

Once again at this parameter, the Moldova and Nero varieties are the most resistant, followed by the Chasselas dore variety, and the more sensitive than the Bujorul is the Muscat de Hamburg variety, and the most sensitive is the Victoria variety (3.86).

Grapevine powdery mildew result

Table 4 shows the comparative data between the varieties, about attack frequency (F%) of grapevine powdery mildew as a result of the statistical analysis.

Table 4

Grapevine powdery mildew frequency (F%) compared between varieties

	Nero	Victoria	Muscat Haburg	Bujorul	Moldova	Chasselas dore
Nero	-	-8.93 ⁰⁰⁰	-15.34 ⁰⁰⁰	-10.77 ⁰⁰⁰	-14.18 ⁰⁰⁰	-6.37 ⁰⁰⁰
Victoria	8.93 ^{***}	-	-6.41 ⁰⁰⁰	-1.84	-5.25 ⁰⁰	2.56
Muscat Hamburg	15.34 ^{***}	6.41 ^{***}	-	4.57 ^{**}	1.16	8.97 ^{***}
Bujorul	10.77 ^{***}	1.84	-4.57 ⁰⁰	-	-3.40 ⁰	4.40 ^{**}
Moldova	14.18 ^{***}	5.25 ^{**}	-1.16	3.40 [*]	-	7.80 ^{***}
Chasselas dore	6.37 ^{***}	-2.56	-8.97 ⁰⁰⁰	-4.40 ⁰⁰	-7.80 ⁰⁰⁰	-

DL5% - 2.83; DL1% - 4.03; DL0.1% - 5.84

The results in the above table show that the frequency of powdery mildew attack between Bujorul and Victoria is not statistically assured. The varieties that have shown to be more resistant are the Nero and Chasselas dore varieties, and the most sensitive is the Muscat de Hamburg next to Moldova variety.

Table 5 shows the comparative data between the varieties, about attack intensity (I%) of grapevine powdery mildew as a result of the statistical analysis.

Table 5

Grapevine powdery mildew attack intensity (I%) compared between varieties

	Nero	Victoria	Muscat Haburg	Bujorul	Moldova	Chasselas dore
Nero	-	-8.63 ⁰⁰⁰	-16.49 ⁰⁰⁰	-11.47 ⁰⁰⁰	-15.80 ⁰⁰⁰	-3.96 ⁰⁰
Victoria	8.63 ^{***}	-	-7.86 ⁰⁰⁰	-2.84	-7.17 ⁰⁰⁰	4.67 ^{***}
Muscat Hamburg	16.49 ^{***}	7.86 ^{***}	-	5.02 ^{***}	0.69	12.53 ^{***}
Bujorul	11.47 ^{***}	2.84 ^{***}	-5.02 ⁰⁰	-	-4.33 ⁰	7.51 ^{***}
Moldova	15.80 ^{***}	7.17 ^{***}	-0.69	4.33 ^{***}	-	11.84 ^{***}
Chasselas dore	3.96 ^{***}	-4.67 ⁰	-12.53 ⁰⁰⁰	-7.51 ⁰⁰⁰	-11.84 ⁰⁰⁰	-

DL5% - 3.33; DL1% - 4.73; DL0.1% - 6.85

The most resistant varieties to the intensity of the powdery mildew attack are the Nero and Chasselas dore varieties, and the most sensitive are Muscat de Hamburg and Moldova. Between the Bujorul and Victoria cultivars, there were no statistically guaranteed differences in attack intensity.

Table 6 and figure 2 shows the comparative data between the varieties, the degree of attack (Da%) of grapevine powdery mildew as a result of the statistical analysis.

Nero (-5.31) and Chasselas dore (-3.06) were more resistant to the degree of powdery mildew attack compared to the Bujorul variety.

The Victoria variety and the Bujorul showed low, statistically unsecured differences between them (-2.84).

The most sensitive to powdery mildew are Muscat Hamburg (5.02) and Moldova (4.33) varieties.

Table 6

Grapevine powdery mildew degree of attack (Da%) compared between varieties

	Nero	Victoria	Muscat Hamburg	Bujorul	Moldova	Chasselas dore
Nero	-	-4.02 ⁰⁰⁰	-8.36 ⁰⁰⁰	-5.31 ⁰⁰⁰	-7.71 ⁰⁰⁰	-2.25 ⁰⁰⁰
Victoria	4.02 ^{***}	-	-4.35 ⁰⁰⁰	-1.29	-3.70 ⁰⁰⁰	1.77 [*]
Muscat Hamburg	8.36 ^{***}	4.35 ^{***}	-	3.05 ^{***}	0.65 ⁻	6.11 ^{***}
Bujorul	5.31 ^{***}	1.29 ⁻	-3.05 ⁰⁰⁰	-	-2.41 ⁰⁰	3.06 ^{***}
Moldova	7.71 ^{***}	3.70 ^{***}	-0.65 ⁻	2.41 ^{**}	-	5.47 ^{***}
Chasselas dore	2.25 ^{**}	-1.77 ⁰	-6.11 ⁰⁰⁰	-3.06 ⁰⁰⁰	-5.47 ⁰⁰⁰	-

DL5% - 1.30; DL1% - 1.85; DL0.1% - 2.69

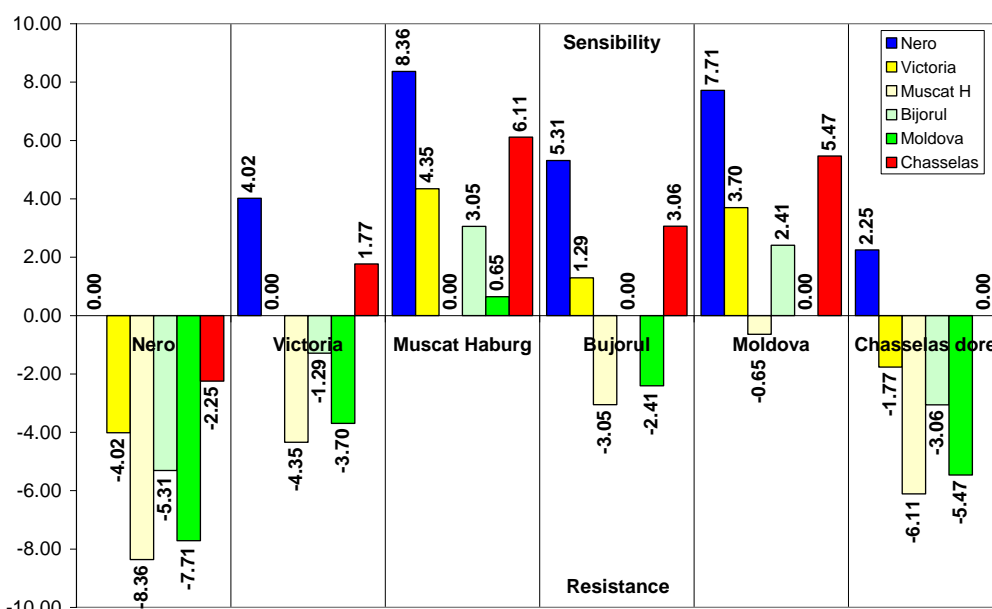


Figure 2. Illustration of grapevine powdery mildew degree of attack (Da%) compared between varieties

CONCLUSIONS

The Bujorul variety behaved much better against the downy mildew attack than the Victoria and Muscat de Hamburg varieties, and in terms of powdery mildew it behaved better than the Muscat de Hamburg and Moldova varieties.

Among the varieties studied, the Nero variety was shown to be the most resistant to both diseases, and the Victoria variety the most sensitive. The Bujorul variety proved to be medium resistant, confirming the authors' description of the variety.

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