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RECONSTRUCTION AND DEVELOPMENT OF HIGH-QUALITY VITICULTURAL AREAS IN MEHEDINȚI (OLTENIA)

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ABSTRACT

Situated in the southern part of the country, influenced by the Mediterranean climate and the proximity of the Danube, the vineyards on the Mehedinți hills have always produced highly acclaimed, top-quality wines. Climatic data indicate significant accumulation of heat units and sunshine hours, ensuring favorable conditions for grape ripening and the synthesis of compounds of great oenological value within the berries, primarily sugars and anthocyanins. Mehedinți red wines captivate with their commanding presence and color, their exciting aromatic profiles and bouquets, and a taste of true nobility where robustness and firmness meet roundness and velvety smoothness.

INTRODUCTION

Today, at a time when global vineyard acreage is shrinking and only the highest-quality wines are successfully finding a place on the market, Romania's wine-growing regions are undergoing a process of extensive restructuring and development.

Consequently, winegrowers must re-establish and develop viticulture in areas best suited for high-quality wine production; only in this way can Romania regain its former renown in the world of wine.

Our research aimed to highlight the quality potential of specific areas in the Mehedinți region by providing further evidence regarding the favorable nature of climatic conditions and soil types as reflected in the performance of cultivated grape varieties and, above all, the quality of the resulting wines ultimately helping to identify the specific zones capable of producing wines with a Controlled Designation of Origin (DOC).

Our studies built upon the findings of numerous previous researchers, as validated by viticultural practice (Teodorescu Șt., Popa A; Sandu Gh., 2021; Condei Gh., Ciolacu M., Dumitru I., 2006; Popa A., Giugea N., Genoiu C., 2015; Dejeu L., 1984; Popa A., 2012).

MATERIALS AND METHODS

For each of the study areas, values for the key climatic elements affecting grape quality, specifically air temperature, sunshine duration, and precipitation levels during the

growing season, were identified and calculated over a 50-year period (1970–2020) with the assistance of the Oltenia Regional Meteorological Center in Craiova.

Based on these values, the oenoclimatic suitability index [A = T + I - (P-250)] was calculated; this index accurately reflects the types of wine that can be produced in a given viticultural area.

Precipitation occurrence and levels were also recorded over the same 50-year period for the months of August, September, and October—the time when the delicate grape ripening process reaches completion.

Soil profiles were created in each viticultural area to determine soil types and their physicochemical and biological properties, in collaboration with O.S.P.A. Mehedinți.

The physicochemical characteristics of the wines were established based on historical records and laboratory analyses conducted by our team on wines produced over the last four years.

Finally, areas with the potential for producing quality wines were identified, and the criteria to be considered for the restructuring and development of these areas were established.

RESULTS AND DISCUSSIONS

I. Geographical and climatic aspects

The wine-growing centers of Mehedinți (Drobeta Turnu Severin, Vânju Mare, Oravița, Golul Drâncei, Oprișor) are located on the hills of the Getic Piedmont in the southern part of Oltenia.

The location of these centers within a depression inside the Carpathian-Balkan arc and at its foothills imparts specific characteristics to the climate; the most significant is the sub-Mediterranean influence, which overlays the temperate-continental climate typical of the entire country.

Atmospheric circulation is characterized by Mediterranean and oceanic origins, bringing warmer, humid air masses and higher levels of precipitation, whether as rain, sleet, or snow, along with less frequent and less intense frost events, and prevailing winds from the west, northwest, and northeast.

The geographical and climatic features of the wine-growing centers under study are presented in table 1.

The oenoclimatic suitability values range from 4,682 (Corcova) to 4,929 (Drobeta-Turnu-Severin), explaining the suitability of these areas for producing top-quality red wines.

Climatic elements during the growing season are presented in table 2.

Precipitation gradually decreases during August, September, and October, creating conditions that help prevent the onset of grey mold on the grapes. Sunshine duration is greater in spring, summer, and even autumn. July is the hottest month; temperatures in August remain quite close to those of July but drop significantly in September and October.

Table 1

Geographical and climatic elements of several wine-growing centers in Mehedinți (Average climatic data for the years 1970–2020)

Winery Center	N latitude	Altitude (m)	Average annual temperature (^{0}C)	Total annual precipitation (mm)	Sum 1.IV-30.X			Oenoclimatic suitability (A) A=T+I –(P-250)
					T	I	P	
					Temperature degrees (^{0}C)	Sunshine hours	Rainfall (mm)	
Drobeta Turnu Severin	44^{0}38’	116	11, 6	762	3487	1546	354	4929
Vânju Mare - Orevița	44^{0}25’	86	11, 0	634	3388	1549	309	4878
Golul Drincii – Oprișor	44^{0}18’	130	10, 7	587	3339	1550	287	4892
Corcova	44$^{00}_{35'}$	150	10.7	741	3313	1546	374	4682

Table 2

Climatic elements in the wine-growing centers of Mehedinți

Month	Winery Center											
	Drobeta Turnu Severin			Vânju Mare – Orevița			Golul Drincii – Oprișor			Corcova		
	Rrainfall (mm)	Sun's radiance (hour)	Average Temperature (^{0}C)	Rrainfall (mm)	Sun's radiance (hour)	Average temperature (^{0}C)	Rrainfall (mm)	Sun's radiance (hour)	Average temperature (^{0}C)	Rrainfall (mm)	Sun's radiance (hour)	Average Temperature (^{0}C)
April	70	173	12, 4	58	184	11, 8	52	185	11, 5	65	182	11,6
May	62	186	17, 3	61	248	16, 9	60	248	16, 8	67	248	16,5
June	70	275	20, 8	63	274	20, 2	63	274	19, 9	74	263	19,8
July	79	316	22, 7	65	311	22, 2	48	306	22, 0	82	300	21,8
August	36	302	22, 5	31	297	21, 7	28	295	21, 2	44	286	21,4
September	35	217	18, 5	31	225	17, 9	29	234	17, 8	39	222	17,4
October	40	173	12, 8	29	174	12, 1	24	175	12, 0	32	173	11,8

II. Soil Characteristics

Nine soil types predominate across the Mehedinți wine-growing centers, while they generally vary from one area to another, they all possess great potential for high-quality viticulture, particularly for red wines.

These soils are permeable and sandy, clay in texture, with a reddish, pebbly clay substrate that creates an excellent environment for vine growth and fruit production; furthermore, the presence of ferromanganese concretions significantly influences the accumulation of coloring compounds.

The main soil types in the wine-growing centers of Mehedinți are presented in table 3.

The soils range from slightly acidic to moderately alkaline, with a calcium carbonate content of up to 28 %, and possess low to moderate nutrient levels.

Table 3

Predominant soil types in the wine-growing centers of Mehedinți

Soil type	Drobeta Turnu Severin	Golul Drincii-Oprișor	Vânju Mare	Orevița	Corcova
Psammic Preluvosol	-	-	X	-	-
Eroded reddish preluvosol	-	X	X	-	-
Calcic Preluvosol	X	-	-	-	-
Eroded (skeletal) Preluvosol	X	-	-	-	X
Psamic luvosol	X	-	-	-	-
Typical skeletal Luvisol	-	-	-	X	-
Skeletic Eutricambosol	-	-	-	X	-
Lithosols on skeletal limestones	-	-	-	X	-
Skeletic Regosols	-	X	-	-	-

III. Wine composition and quality

The results confirm that the red grape varieties from Mehedinți achieve high alcohol potential while maintaining a level of fixed acids that makes them highly suitable for aging.

They possess a very rich non-reducing extract which, combined with the alcohol content, imparts a distinctive finesse to these quality wines. They are characterized by a high polyphenol content as well as high values for color intensity and hue, making them unique and easily recognizable. The balance between high alcohol content and firm acidity ensures optimal aging potential for these varieties; the physicochemical characteristics are detailed in table 4.

Table 4

Physicochemical characteristics of Mehedinți wines

Component	Type of wine							
	Muscat-Otonel	Cabernet Suvignon			Melot		Syrah	
	Wine-growing centers							
	Drobeta Turnu Severin	Vânju Mare – Orevița	Golul Drincii – Oprișor	Corcova	Golul Drincii – Oprișor	Corcova	Golul Drincii – Oprișor	Corcova
Alcohol (vol%)	13,9	13,1	13,9	12,9	13,9	13,6	13,3	13,0
Total acidity (g/L tartaric acid)	4,0	4,6	4,7	6,4	6,9	6,5	6,5	6,5
Non-reducing extract	25	27,8	37	31	35	31	32	30
Glycerol (g/ l)	9,0	9,8	10,2	8,7	10,2	8,9	8,7	10,6
Polyphenol index	-	38,0	39,5	42,0	43,0	39,0	57,2	53,0
Color intensity (C.I.)	-	12,1	12,06	13,6	12,5	12,4	12,91	12,8
Hue (color tone)	-	0,29	0,29	0,33	0,33	0,32	0,37	0,38
Organoleptic assessment (1–20 points)	19	19	20	19,7	19,5	19,3	19,5	19

Their components and proportions, as well as their balance, endow Mehedinți wines with a distinct, spirited personality and a long-lasting finish, while also making them exceptionally well-suited for maturation and aging; through this process, they become unmistakable and worthy of the highest acclaim.

CONCLUSIONS

Strict delineation of areas with proven quality potential; this delineation must be carried out down to the individual vineyard plot level, particularly where wines of the highest quality (D.O.C. - C.M.D.; D.O.C. - C.T.; D.O.C. - C.B.) can be produced;

Cultivation of grape varieties that have historically demonstrated the best ability to capitalize on the specific soil and climate conditions of each area;

Introduction of new varieties—following preliminary assessment—that show promise for producing quality wines, thereby broadening the range of available varieties (e.g., Chardonnay, Syrah, Marselan);

Cultivation on significant acreage of indigenous varieties (e.g., Fetească Neagră, Negru de Drăgășani, Alutus, Crâmpoșie, Victoria);

Preferential use of local microflora (yeasts, lactic acid bacteria) in the winemaking process;

Expansion of the range of wine types produced, particularly through the use of traditional or new varieties;

Creation of a viticultural record (dossier) for each wine-growing area, accompanied by the establishment of wine collections.

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