

Key words: grape vine, chemical compounds, quality, climate, soil.

ABSTRACT

Geographical areas that are suitable for wine-growing include multifarious climatic region, relief and soils, which, correlated with variety and stock peculiarity, are determinative in order to obtain high quality grapes production and wines.

Climatic changes leads to disturbance in the normal development of physiological and biochemical processes in plants, with great implication in quality and specificity of wine-growing and wine-making products.

Being a traditional occupation in our country, Romanian viticulture has already established the most favourable areas in order to obtain high quality wines from determined regions, but it is important to follow the development and adaptation of grape vine to present climatic changes.

With a view to study the evolution of several chemical compounds that define the quality of wine-growing and wine-making products and the influence of pedological and climatic parameters, I've accomplished a series of researches inside of two viticultural centres from Oltenia: Banu Mărăcine and Segarcea.

My observations and researches aim the following targets:

- Comparative evaluation of pedological and climatic parameters implicated in accumulation of chemical compounds that defined the quality of grapes production.
- To study the dynamics of several chemical compounds from grapes in proportion with climatic resources from investigated viticultural areas.
- To establish the influence of climatic variability on evolution of main chemical compounds, which define the quality of grapes production.

- Delimitation of several basic territorial units inside Segarcea viticultural area, which are representative for quality of grapes production.

The study has 218 pages, structured as follows:

- Chapter I – Introduction
- Chapter II – Present state of knowledge concerning chemical compounds defining the quality of grape production – includes scientific documentation concerning the factors that influence the evolution of main chemical compounds from grape berry and the biochemistry of their synthesizing process.
- Chapter III – Personal contributions – contains data regarding the characterization of natural environment where the researches are developed, biological material, methods of determination, climatic characterization of wine-growing areas, results obtained and statistical interpretation of the results.
- Chapter IV – Conclusions
- Bibliographical references

The thesis contains 41 tables, 93 figures and 7 thematic files. The bibliographical list includes 129 titles and 11 personal articles.

The complex evaluation of climatic resources, using unit and synthetic climatic indexes, clearly expresses very generous helio-thermic resources offer of Banu Mărăcine and Segarcea wine-growing centres, thus being ensured the quality and specificity of the wine-growing and wine-making products obtained in those areas.

The values of oenoclimatical aptitude index in Banu Mărăcine and Segarcea wine-growing centres (values over 4600 for all studied years) attest the high favourable capacity of these areas to produce qualitative red wines.

Comparative analysis of climatic data from the three studied years relieves the state of 2007 and 2008 viticultural years, when the atypical values

of climatic parameters had an important influence on ripeness dynamics, without prejudice to quality of grapes production; on the contrary, the quality increased, relieving the viticultural value of these areas.

In 2007, it is worthy of note the high quantum of helio-thermic resources, but also the abundance of precipitations. During 2008 ripeness stage, a deep hydric deficit had been recorded. The effect of dryness had been enhanced by the temperatures recorded in august: average value of maxim temperature was 31.8°C in Banu Mărăcine wine-growing centre and 32.6°C in Segarcea.

There are several climatic differences between the two viticultural centres. Segarcea area has higher thermic resources than Banu Mărăcine area (higher values of effective balance of heat, average annual temperature, number of days with temperatures more than 30°C) and more precipitations fall over a year or during period of vegetation process. Also, it is worth to note more differences between viticultural years as regards average values of annual temperature for Banu Mărăcine wine-growing centre and, respectively, higher amplitude of temperature from day to night – useful for development and preservation of anthocyanins and flavours – in case of Segarcea wine-growing centre.

On terms of both wine-growing centres, all three studied varieties have recorded a maturity of grapes that are able to provide high quality wines.

The analysis of vine development attests the dependence of chemical compounds from grape (glucides, anthocyanins, acides) on climatic resources – the relationship between these parameters is statistically sustained in proportion to unit and synthetic climatic indexes – and, also, on length and intensity of distinct climatic parameters during veraison and ripeness periods.

Only helio-thermic resources influenced the amount of glucides, the variability of glucides accumulation process being the effect of variation of effective balance of heat, insolation amount and interaction of average

temperature, maximum temperature and length of the day (Huglin index). Precipitations have no statistical sustained influence.

The values of total acidity amount are predominantly determined by the variability of effective balance of heat, and only in on a small scale by variability of insolation quantum. The amount of precipitations has a small positive influence, and only regarding Cabernet Sauvignon variety, on this parameter.

It is worthy of note the lack of influence on grape production as concerns the variability of average weekly temperature during ripeness time.

The anthocyanins content reaches a high level at maturity and post-maturity moments for Cabernet Sauvignon and Merlot varieties. Attainment of a large amount of this compound was favoured by the increasing of temperatures sum and insolation, as a result of climatic characteristic of viticulture year or because of the prolongation of maturity. The influence of hydro-helio-thermic resources, expressed by synthetic indexes (I_{bcv} și I_{hht}), on the accumulation of anthocyanins in berry skin is statistically confirmed.

Within the precincts of Segarcea wine-growing area, I developed a comparative study regarding the behavior of the same variety (Sauvignon) on two lots where the climate, exposition, variety and wine-growing practices are accounted to be immutable factors and qualitative and quantitative differences of grapes production are due to soil peculiarities.

A greater amount of heat is accumulated on calcareous regosol, and then it is gradually disengaged. The process favoured a good development of grape vine, and correlated with exposition and position on slope, cause precocity of veraison and maturity phases. This characteristic is useful in case of a rainy maturity period or when the post-maturation is wanted. On map of Segarcea wine-growing area, two basic territorial units were delimited, having qualitative and quantitative differences of grapes production.