

Prospects for enlarging of microzone *Manavi* in the East Georgia

Les perspectives d'extension de l'appellation de *Manavi* en Géorgie orientale

Dr. Maya Mirvelashvili*, Dr. Tamaz Kobaidze, Dr. Temur Dekanosidze, Dr. Vazha Gogotidze
Georgian Research Institute of Horticulture, Viticulture and Winemaking, №6 Marshal Gelovani ave.
Georgia, Tbilisi,

*Corresponding author: m_mirvelashvili@hotmail.com, Fax: (99532) 52 30 11

Summary

The experimental studies conducted in the eastern Georgia in Sagarejo administrative district on the foothills of the southern slope of Tsiv-Gombori range reveal the possibility of enlarging *Manavi* traditional specific zone to the north-west (from Giorgitsminda to Khashmi), at 500-750 m above sea level. Transitional climate from dry subtropical to moderately humid, relief, black cinnamonic soils, distinguished quantitative indices of the Kakhuri Mtsvane grape cultivar provide the best conditions for production of European type wine – *Manavi* source region. The wine has light-straw color, greenish tint, soft taste, harmonious, exquisite, with fruit aroma and developed bouquet.

Key words: Kakhuri Mtsvane, wine *Manavi*, micro climate, landscape, microzone.

Introduction

Kakhuri Mtsvane belongs to the oldest local cultured grape varieties. By morphological, ampelographic and agricultural features it is similar to other aboriginal grape varieties and together with them represents one whole family. According to biological characteristics it is considered that Mtsvane is older than Rkatsiteli variety which is believed to be originated as early as the 5th century B.C., by I. Javakhishvili's linguistic analysis (Javakhishvili, 1983).



Figure 1 Grape seed from Ninotsminda of the Sagarejo region (IV-III millennia B.C.)

During archeological excavations conducted in the village Ninotsminda of the Sagarejo district by N. Berdzenishvili in 1951 there were found seeds of cultured grape in one of the tombs (the end of IV – beginning of III millennia. B.C.), see Fig.1. The ampelographic studies performed by professor M. Ramishvili suppose that they could belong to Mtsvane and Budeshur grape varieties (Bokhochadze, 1963). If we summarize the results of archeological, ampelographic and linguistic studies, we can easily conclude that the age of the Mtsvane is more than 24 centuries (Javakhishvili, 1983).

Thanks to their earthenware jugs and wine-cellars (known as “chur-marani” in which wine is matured and stored) and remarkable wines, *Manavi* vineyards were in private property of the Georgian kings in the course of centuries (Vakhushti Batonishvili, 1973). Kakhuri Mtsvane had covered larger area than

any other variety before the intrusion of fungi diseases into Kakheti and Kartli. (In Kartli-Kakheti region there was spread an infectious diseases “*Uncinula necatar Burr*” in 1850 and since that the area covered with Mtsvane has been dramatically reduced (Tabidze, 1954). In 1936 this variety was put into Industrial Standard Assortment of Kakheti and its restoration and development was planned on the wide area.

In the forties of the 20th century the area cultivated with Mtsvane made 1046 ha. The development of the grape variety was well expressed in the following years too. By 1965 the area covered with Mtsvane already exceeded 2500 ha and this level was maintained for 20 years. However, the adoption of the statute on Drunkenness and Alcohol Control in the country in 1986 and tough political and economic situation created in Georgia in the following years appeared dramatic for the development of viticulture. The area of Mtsvane has been notably reduced and destroyed.

Materials and methods

In the East Georgia the agroclimatic indices of the Manavi traditional microzone have been determined using the following methods: measuring the height above sea level by aneroid barometer; statistical treatment (trapezium) of total active temperatures; determination of Kakhuri Mtsvane phenological phases using *Bajoliny’s* method, mechanical composition of pipette (sedimentation technique), humus determination using Tiurinis method.

The evaluation of wine occurred on the local market in accordance with GOST. 13191-73 “On general rules and regulations of grape wines production”; wine samples prepared according to OIV (MA-E-AAS 312-01) underwent degustation evaluation.

Spreading area

Specific zone of Manavi wine production is located in the Outer Kakheti region of Sagarejo administrative district, on the foothills of the southern slopes of the Tsiv-Gombori range. The area of the raw-material covers 346 ha and includes the villages of Tokhliauri, Manavi, Burdiani, Giorgitsminda, Anthoki, Mariamjvari, Didi and Patara Chailuri, Kakabeti, Verkhviani (see Fig. 2).

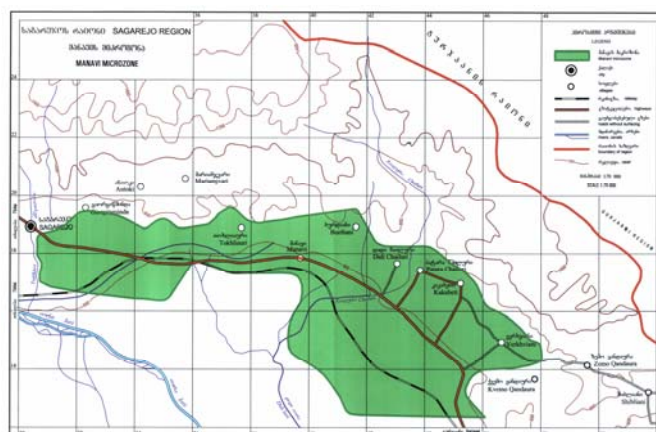


Figure 2 Map of the Manavi microzone.

Climatic conditions

Climate in this microzone is moderately humid, with moderately cold winter and warm long summer. Its specific character is mainly conditioned by relief peculiarities of the territory such as the height above sea level and atmospheric processes developed there which is obligatory precondition to create necessary key factors for the grape variety. In this case, Sagarejo-Kakabeti foothills zone of Tsiv-Gombori range and the above mentioned villages located between them have ideal conditions where vineyards are protected from prevailing winds of south-western and northern direction by southern ridge of the Tsiv-Gombori mountain system and in summer and winter the warm air masses intruded from the south (from Azerbaijan territory) by passing Ivris Zegani run into obstacle from Tsiv-

Gombori mountain range system. Such unique location offers favorable conditions for heat penetration and, in a peculiar way, forms and creates the image of premium quality delicate dry wine - Manavi which is distinguished for its exclusive content, full of fruit flavor and perfect bouquet.

Historically grape variety Kakhuri Mtsvane manifests its unique properties here, in moderately warm, humid climatic zone (in the north-west part of the Outer Kakheti, especially Kakabeti, Manavi, Sagarejo, Ninotsminda, Khashmi vineyard areas). In the mentioned area water demand from spring to the second part of the summer makes approximately 340 mm or 3400 m³ per ha. The amount of rainfall occurred in this period is almost identical to vine demands. Therefore, in the period denoted by an average long-term data the grape vine does not need watering. The total of active temperatures in the miscozone is within 3800-3500⁰ on average. The mean temperature of the warmest months (July, August) is 23.5-22.5⁰, the annual amount of rainfall makes 650-759 mm, and in vegetation period it varies in the range of 450-550 mm.

The output obtained from the comparatively low located Iori riverside significantly yields the wines from Manavi microzone according to their properties. In our view, the reason must be in cultivation of the vineyards in forest-steppe zone where environmental conditions (heat, humidity) fail to provide the obtaining of source region production.

In the second half of the summer and beginning of the fall (July, August, till middle of September) only around 160 mm rainfall occurs in the microzone. In this period water requirement of grape makes 287 mm which means that vineyards demand exceeds the amount of natural rainfall by 125 mm per 1250 m³.

The number of thunderstorms in the course of the year is within 0.9-2.6 according to the height above sea level.

Soils

Field morphological and laboratory investigation of the soils implied study of the soil profile from the surface including the main rock both by morphological features and in laboratory by physico-chemical characteristics. For this in different spots of the specific zone there were made cross sections in correspondence with the soil types and their difference on the basis of which the soils singled out in a zone with their subtypes and diversity were classified in the following way: cinnamonic, meadow cinnamonic and alluvial-prolluvial.

Cinnamonic soils are spread on the territory of the villages: Chailuri, Kakabeti and Verkhviani where active humus layer makes 35-50 cm; the structure in the accumulative layer is bean-shaped cloddy, and in the transition layer it is fine-grained or bean-shaped and characterized by skeletness and stoniness.

Meadow cinnamonic soils are presented on the territory of the village Manavi. The profile thickness of this soil reaches 1.5-2.0 m. Active humus layer is 45-50 cm. The formation of genesis horizons is not well expressed. The structure in the upper layers is bean-shaped cloddy and in the lower layers it is either not well expressed or structureless.

The alluvial-prolluvial soils are presented in the villages of Manavi, Tokhliauri, Chailuri, northern part of Sagarejo-Giorgitsminda territory, on the slopes of Chailuri, Matiant and Giorgitsmindis gorges. It is characterized by deep thickness profile and 40-50 cm thickness of humus layer, fine-grained cloddy structure in the lower humus layer. Strong skeleton and stony soil. Debris cone is developed on stony and sandy sediments.

As a result of laboratory studies it has been established that cinnamonic and meadow cinnamonic soils are mainly characterized by low humus content and in the active layer their amount is mainly in the range of 3.5-1.5%.

Hydrolyzed nitrogen in the upper layer at the depth of 0.60 cm is within 11.70-5.60 mg per 100 g of soil which appears to be an average index, and naturally in the lower layers decreases. With the same regularity soluble phosphorus and exchangeable potassium content are distributed with some exceptions.

The northwestern part of the specific zone is presented with identical soil types (cinnamonic, meadow cinnamonic and prolluvial-alluvial), with their diversity and different rate of skeleton.

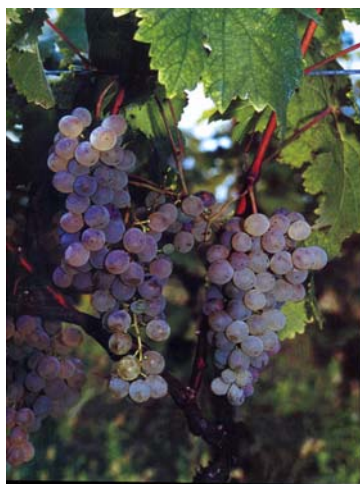


Figure 3 Vine of Kakhuri Mtsvane.

Characterization of the grape variety

Kakhuri Mtsvane is the oldest representative of the aboriginal grape varieties. In the same way as other Georgian grape varieties (Mtsvane Ajaruli, Mtsvane Rachuli, Goruli Mtsvane, etc) the name Mtsvane is given because of the green color of the matured grape berry (Fig.3). More than 6 variations and clones of the variety have been detected (Tabidze, 1954). It gives top quality production both of the source region and for perfection of ordinary wines. Compared with other Georgian grape varieties it is characterized by average growth. Similar to the majority of Kakhetian grape varieties it gives the first crop on the 1st-3rd year and from the 4th year enters into complete ripeness.

In relation to *Uncinula* it is weakly resistant but comparatively higher above the sea level in conditions of mild climate this variety is less damaged by *Uncinula* and reaches good growth and development giving high quality crop. Characteristic feature is blossom fall above the normal (as a result thinness of the grape cluster). One more remarkable feature of Mtsvane is its high-yielding ability per hectare; it gives 50-80 centner per hectare. Good grape output compared with Rkatsiteli in 4-5%, (Rkatsiteli is a leading Georgian variety), great sugar accumulating ability 22-23% preserving normal acidity 6.0-7.8 g/dm³; resistant to phylloxera, *Plasmopara* grape worm and frosts.

Budbreak	Beginning of blossom	Maturation				Leaf fall	Duration from budbreak to leaf fall	Grape quality	
		Beginning	$\sum T > 10^{\circ}\text{C}$	Ripeness	$\sum T > 10^{\circ}\text{C}$			Sugar content (%)	Acidity (g/dm ³)
22.IV	5.VI	15.VIII	2300	25.IX	3500 ⁰	29.X	190	22-23	6.0-7.8

Table 1 Main phenological phases of the Kakhuri Mtsvane in the Manavi microzone

Here the warm fall with elevated heat regime creates favorable conditions for timely ripening of grape. Complete ripeness occurs after accumulation of total active temperatures 3100⁰ and more ($\sum T > 10^{\circ}\text{C}$). Top quality products are obtained when the total of active temperatures exceeds 3500⁰. The number of such years in the microzone is around 35-30%.

Wine

Grape juices saturated with aromatic substances and top quality table wines of European and Kakhetian type are obtained from the Mtsvane grape varieties.

Manavi is a high quality European type dry white wine. It is made from the Mtsvane grape variety cultivated in the village of Manavi (Kakheti) by adding 15% of Rkatsiteli grape variety. The Mtsvane wine prepared by European way is of greenish pale-straw color, has harmonious taste, bouquet characteristic for the variety with well pronounced wonderful fruity aroma.

However, the wine of Kakhetian type is of dark-tea color, more completed, full-bodied and energetic. It has comparatively strong and pleasant flavor which is transformed into bouquet with clear tones of aging fruit. The greatest value of the Kakhuri Mtsvane grape is the lifetime of wine, high quality of must and wine, transportability and used as a blend in wines of origination places. From Mtsvane wine materials using blending technique the worldwide known wines Tsinandali and Gurdzhaani are produced. The small part of this cultivar is used as a dessert grape of local importance.

Half century ago the Samtrest company prepared two European brands: Mtsvane and Manavis Mtsvane from the Mtsvane grape variety (Beridzde, 1961; Dekanosidze et al. 2006; Mirvelashvili et al. 2006). The wine Mtsvane is produced from the grapes cultivated in Tsinandali, Napareuli and Mukuzani microzone vineyards and the wine Manavis Mtsvane is made from the grapes Kakhuri Mtsvane grown in Manavi microzone which is distinguished as more light and tender. Both wines were awarded numerous gold and silver medals. Currently in the Manavi microzone, Manavi wine is being produced.

Conclusion

In the traditional zone of the Manavi wine production, the Kakhuri Mtsvane grape variety gives the best quality product on the eastern slopes of foothill at around 500-750 m above sea level. The grape attains full ripeness after accumulating the total ($\sum T > 10^{\circ}\text{C}$) of active temperatures of 3100⁰ and more. The top quality product is obtained in those years when the average temperature of the warmest months exceeds 23⁰C and total of active temperatures is 3500⁰. The number of such years in the microzone reaches 35-50%.

To create better conditions for warmth and lighting one of the most important measures is to direct grapevine rows from the north to the south. In order to avoid the overdryness of soil and ground air layer caused by the action of warm air masses, the planting of wind protecting trees is needed. For the purpose of weakening winter frosts and freeze, the grapevine should be grown at 80-100 cm height stem. It is interesting to note that Rkatsiteli grape variety cultivated in the Manavi microzone gives much tenderer, soft, velvet wine materials for European table dry wines also rather than that of grown in the lowland zone of the Inner Kakheti.

The results of the study suggest that the growth of the Manavi microzone vineyards in the north-western direction of Kakheti Kharshmi belt in the range starting from 500 m to 750 above sea level would be perspective. This provides an increase of the production of top quality Manavi wine with the name of the source region from Kakhuri Mtsvane grape variety.

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