Association Prosperity and Development in Bulgaria
Project:"SOS for endangered traditional vine varieties"
Acronym: "VineSOS"
Project No. 1829

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Vitis vinifera or the so-called wild grapevine - the challenges of the project "VineSOS"

The „SOS for endangered traditional vine varieties" deals mainly with common challenges and problems in the Greek - Bulgarian Cross-border Region (Fig. 1) related to local biodiversity and vine varieties, especially those in the sites of "Natura 2000". Leading beneficiary is the Executive Agency for Vine and Wine. Its partners are: Association "Prosperity and Development in Bulgaria", Business & Exhibition Researches and Development Institute (IEE)), Greece, and the International Hellenic University, Thessaloniki.

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Fig.1 – Greece-Bulgaria Cross-border Region

The "SOS project for endangered traditional vine varieties" evaluated the effect of conventional, organic and biodynamic systems for the production of traditional vine varieties. Experimental fields were created in the area of the Greek-Bulgarian cross-border region, which showed a different approach to determining the most appropriate system of agriculture at both national and local level (Fig. 2). The project studied the content of anthocyanins and transsveveratrol in eight traditional varieties grown in different abiotic conditions, using plant hormones. (Fig. 3)

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Fig.2 – Experimental fields

Fig.3 – Activities executed under the project

Vitis vinifera or the so-called wild grape belongs to the genus Vitales and the family Vitaceae and covers many different varieties grown in the Mediterranean region. The plant has been cultivated for thousands of years because of its medical and nutritional value. The fruits of the vine, rich in carbohydrates, are called grapes.

Co-funded by the European Regional Development Fund and by national funds of the countries in Interreg VA "Greece-Bulgaria 2014-2020" Cooperation Programme
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After fermentation, they are used in the alcohol industry for the production of wine and other spirits such as tsipuro and ethanol alcohol. Grapes are the fruits of plants of the genus Vitis, known in Bulgarian as vines.

From botanical point of view, grapes are classified as berry fruits. Worldwide, about 80,000 km2 of agricultural land is suitable for growing vines and producing grapes. Grapes are consumed raw, dried - as raisins, processed - in the form of beverages (wine, must, etc.), jellies and jams, but much of the world's grape production (about 70%) is used to make wine.

The grapes are characterized by spherical, oval fruits growing in piles, called clusters, uniting from 15 to 300 berries. The color of the fruits themselves has a variety of shades from light green, yellow, amber, pink, red, blue, to dark purple and even black. When the fruits ripen, they have a high sugar content.(Fig.4)

Fig.4 – Different varieties of grapes

Grape growing dates back to about 6000 - 8000 years ago in the Middle East. Yeast or the so-called first "domesticated" microorganisms, found naturally in grape skins, led to a revolution in beverages and the discovery of wine. It has been proven that the condition of vine water significantly affects the photosynthesis of the vine, dry matter and fruit production, as well as the quality parameters of grapes and wine. There are various studies showing that the status of vine water can be manipulated and change the sensory characteristics of wine - aroma, color and taste.

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In many traditional wine regions around the Greek-Bulgarian cross-border region, the seasons can lead to adverse effects on grape production. Repeated periods of heat and drought during cultivation also have an effect.

Although the synergistic effect of light and temperature has been extensively studied on flavonoids, studies focusing on the sole effect of high temperature have focused primarily on anthocyanins during the ripening period of the grape.

As tannin biosynthesis begins around flowering, heat waves occurring earlier in the grape growing season can be critical. Several studies have shown the effect of temperature on tannin synthesis and accumulation. To date, no one has studied the effect of high-temperature extremes, which in the context of climate change are associated with an increase in heat wave intensity.

Anticyanins, which are essentially water-soluble pigments, cause the red, blue and purple color of plants and trans-resveratrol, which is an antioxidant and bioflavonoid. They are one of the most important natural compounds in grapes, as they not only have many biologically active properties, such as antioxidants, cardioprotectors, anti-cancer and anti-inflammatory, anti-aging and antimicrobial properties, but they are also "responsible" for the quality of the wine.

The concentration of grapes can be increased by plant hormones such as abscisic acid (ABA) and methyl jasmonic acid (MeJA), thus alleviating the negative effects of high temperatures in the context of climate change and also improving the oenological quality of wines.

In addition to global warming, which is perceived as a problem and is monitored worldwide, climate change is also affecting drought in various wine-growing areas. The chance that the most affected varieties will disappear irretrievably is high.

This is also one of the main challenges that the wine industry is facing. They range from short-term impacts on wine quality and style, to long-term issues such as varietal suitability and economic sustainability of traditional viticulture.

For the above reasons, we must continue to maintain traditional vine varieties that are climate-tolerant and at risk of drought.

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