

# Multidimensional scaling (MDS) to visual representation of proximities for quality and phytochemical characteristics in *Vitis vinifera* L. cv. 'Ercis'

Nurhan Keskin

<sup>1</sup>Department of Horticulture, Faculty of Agriculture, Van Yüzüncü Yıl University, Van/Turkey -  
E-mail: keskin.nurhan@gmail.com

**Summary.** This study was conducted to determine quality and phytochemical characteristics of 'Ercis' cultivar that is indigenous to Van province for wine and must as well as table grapes due to specific aroma. In this framework, physical (color, cluster weight (g), berry length (mm), berry width (mm) and berry weight (g)), chemical (pH, titratable acidity (TA%), total soluble solids (TSS%), maturation index (MI), sugars, organic acids, total antioxidant activity, macro and micro elements) and phytochemical characteristics (phenolic compounds) of the cultivar were examined. Paired sample t test was performed to determine differences between years. In addition, multidimensional scaling was utilized to indicate visual representation of proximities for the characteristics. Differences between years for cluster weight, berry length, berry width and berry weight were found statistically significant, however, there is no significant differences for other characteristics. In addition, some negative and positive correlations were observed among the physical, chemical and phytochemical characteristics.

**Key words:** multidimensional scaling (MDS), quality characteristics, phytochemical characteristics

## Introduction

Substances which are existed naturally in plant foods, vegetables, fruits, cereals and legumes are called phytochemicals. The basic of a healthy diet is to convenient vitamins, minerals, phytochemicals and fiber consumption. Except from macronutrients called carbohydrates, fats and proteins and 13 vitamins as well as 17 minerals which are necessary for health, the importance of phytochemicals has been realized recently. Unlike vitamins and minerals, phytochemicals cannot to be accepted as food. Today, it has been known that phytochemicals have antioxidant properties for being innocuous of molecules which are called free radicals and attack to cells. These compounds are effective for preventing of cancer, heart diseases, arteriosclerosis, diabetes and weakening of the immune system as well as potential difficulties and problems. Onions, garlic,

leeks, cabbage, cauliflower, broccoli, soybeans, tomatoes, grapes, citrus fruits, carrots, nuts, grains, green tea, olives, beans, peas and cherry are the main source of phytochemicals. As compared to other plant species, grapes come forward due to extensive using as fresh fruit or processed products.

Some physical and chemical changes occur in internal and external structure of the grape berries from veraison period. In addition to these changes, the total soluble solids content increases and titratable acidity ratio decreases during berry maturing period (1).

Basically, grape consists of organic acids, sugars, anthocyanins, tannins, flavoring agents, pectic substances, nitrogenous substances, minerals, enzymes and vitamins.

'Ercis' grape cultivar is local varieties of Van province and has grown the most widely in eastern regions of Turkey about 3000 years. Historical records indi-











