

GEOLOGY OF THE WINES OF SÃO JOAQUIM, SANTA CATARINA STATE, BRAZIL

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ABSTRACT: Geology can be applied to wine science in the study of the characteristics of the physical environment that influence in the grape cultivation and consequently in the wine to be produced. The quality of a wine is the result of an interrelationship between all the factors, above and below the ground surface, that affect the growth of the grape. These factors, each of them constituted by different elements, can be divided into five main groups: meteorological, physiographic, pedological, geological and viticultural. Together they compose the *terroir*, a French term translated by some authors as “sense of place”. The São Joaquim region is privileged with respect to a number of factors that compose its *terroir*, however, there are no studies that demonstrate or quantify them in a holistic approach. Situated in the Southern Highlands of Santa Catarina, in an area with hilly relief and high elevation (between 900 and 1600 meters), São Joaquim is among the highest of the Brazilian viticultural regions. Its climate has an annual average of 13 °C, one of the coldest of Brazil, with mild summers (average of 18 °C) and low temperatures during the winter (average of 9 °C), which, according to the Köppen climatic classification, corresponds to the climate type Cfb (temperate climate, with mild summer). The region is situated on the volcanic flows of the Serra Geral Formation of the Paraná Magmatic Province. In the Province predominates tholeiitic basaltic flows (90% of the total volume), with tholeiitic andesites (7%) and subordinated dacites-rhyodacites-rhyolites. The acid volcanic units (dacites to rhyolites) of the region are located in a prominent place in the topography, the São Joaquim Plateau, and are considered to be of the Palmas-type. The basic volcanic units of the region correspond to basaltic andesites of the Gramado and Esmeralda magma types. All of the volcanic rocks in the area are low-Ti type. On these volcanic flows are located several vineyards, where the grapes are grown for the production of fine wines of altitude (wines produced from European – *Vitis vinifera* – grapes varieties cultivated in vineyards above 900 meters). A relationship can be observed between the geology and the soils of the region: the acid volcanic units are correlated with the *Cambissolos Humicos* (Humic Cambisols), and the basic volcanic unit with the *Neossolos Litolicos* (Leptosols). Factors, controlled by geology and climate, such as physical and chemical properties of soils, slope aspect and direction, rainfall and temperature maxima and minima, directly and indirectly affect the grape cultivation and the wine production. Therefore, analyze and describe them is of extreme importance to know the variables that influence the growth of the *Vitis vinifera*. This work aims to develop a descriptive and integrative model of these factors in the São Joaquim region (*i.e.*, outline the local *terroir*) and to develop predictive models of areas favorable to the grape cultivation destined to the production of fine wines of altitude. For such, a multi-criteria evaluation in GIS (geographic information system) of the meteorological, physiographic, pedological and geological components will be effectuated.

KEY-WORDS: SÃO JOAQUIM PLATEAU, SERRA GERAL FORMATION, FINE WINES OF ALTITUDE.