

Studies on biochemical properties of wine and must of various grape varieties

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ABSTRACT

The studies on biochemical properties of fifteen grapewine varieties, viz. Arka Shyam, Bangalore Purple, Cabernet Franc, Cabernet Sauvignon, Grenache, Merlot, Pinot Meunier, Pinot Noir, Syrah, Arkavati, Chardonnay, Muscat of Alexandria, Sauvignon Blanc, Ugni Blanc and Viognier were carried out. It was revealed that the wine of Syrah (12.15 %) was superior to other varieties studied in respect of alcohol content. Conversely, the maximum acidity (0.88 %) was observed in the wine prepared from Sauvignon Blanc, followed by Chardonnay (0.87 %) and as minimum in the 'wine of Pinot Noir. The wines of Cabernet Sauvignon, Merlot and Pinot Noir recorded maximum pH (3.90), whereas, that of Sauvignon Blanc had the minimum pH of (3.03). The range of volatile acidity in the wines was much below (0.01 to 0.08 %) than the acceptable limit (1gL^{-1}) as per the Indian Standards for wine Constituents. The wine prepared from Cabernet Franc grape contained maximum soluble proteins (0.031%) while, that of Merlot contained minimum soluble proteins. The ascorbic acid content in wines of the 15 varieties varied from 0.77 (Arkavati) to 3.36 mg 100 mL^{-1} (Banglore Purple). The highest anthocynin content in Syrah (19.52 mg 100 ml^{-1}) was among the coloured varieties. Maximum Residual Sugar content (1.88%) in the wine of Arkavati while minimum was found in the wine of Syrah (0.14 %). Biochemical properties of must of these varieties revealed that the highest TSS (27.85 DB) and acidity (0.96 %) was recorded in Arkawati and Ugni Blanc, respectively, while the highest TSS : Acid ratio (43.50) and pH (3.97) was observed in Cabernet Sauvignon. Maximum total sugar (24.54 %) and reducing sugar (23.29 %) was recorded in Arkawati. Significantly highest anthocynin ($100.95\text{ mg }100\text{ ml}^{-1}$) determined in Cabernet Sauvignon followed by Syrah ($89.35\text{ mg }100\text{ ml}^{-1}$).

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Grape (*Vitis vinefera* L.) is grown mostly for wine making in the world. In India the remarkable success has been achieved in table grape production and yield levels are also high as compared to major grape growing countries in the world. However, the production of wine of grape is negligible, due to limited domestic consumption of wine and non availability of standard wine varieties to produce good quality of wine at international standards. Emphasis was not given for research on enology and viticulture in India. It is a need of the day to undertake the research for evaluation of grape wine varieties for growth, yield and quality. Biochemical properties of must and wine may vary according to the varieties and environmental conditions in which the grapes are grown. Hence it was necessary to study the biochemical properties of different wine grape varieties.

MATERIALS AND METHODS

The investigation was carried out at Champagne Vineyards Ltd., Narayangaon, Dist. Pune during 2001-2002. The experiment was laid out in Randomized Block

Design (RBD) with 15 grape wine varieties, viz. Arka Shyam, Bangalore Purple, Cabernet Franc, Cabernet Sauvignon, Grenache, Merlot, Pinot Noir, Syrah, Arkavati, Chardonnay, Muscat of Alexandria, Sauvignon Blanc, Ugni Blanc and Viognier as treatments with three replications. Of these, nine grape varieties were coloured and six were white. Eleven varieties selected for the study were wine grape varieties introduced from traditional grape growing countries and the remaining four varieties, viz. Arka Shyam, Bangalore Purple, Arkavati and Muscat of Alexandria were the native grape varieties suitable for wine making. Different biochemical components of wine and must viz., alcohol (Joshi, 1998), acidity (Negi and Suresh, 1972), volatile acidity, pH (Jackson, 1973) residual sugars (Ranganna, 1986), soluble proteins (Lowry *et al.* 1951), ascorbic acid (AOAC, 1990), anthocynin, TSS : acid ratio, total sugars (Ranganna, 1986) and sucrose (Divakar, *et al.* 1974) were determined as per the analytical procedures mentioned by respective scientist.

RESULTS AND DISCUSSION

Quality Attributes :

The data on biochemical properties of wine of various