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INTRODUCTION

Phenolic compounds are one of the major quality factors in grapes, and therefore in the resulting wine. Many factors may influence the phenolic composition of wine, such as variety, edaphoclimatic conditions and cultural practices. One of these factors is the maturity degree of the grapes used, once the wine prepared from grapes harvested before optimum phenolic maturity shows a lower content of anthocyanins and a higher content of tannins from the seeds, which grants the beverage an elevated astringency and a sensation of “dryness” upon its ingestion. In this context, the present work aimed to study the phenolic content, physical-chemical composition and antioxidant activity of red wines cv Syrah prepared from grapes harvested at different stages of ripeness.

EXPERIMENTAL



Syrah grapes at three different stages of ripeness after pruning (DAP: days after pruning) were submitted to winemaking process at Embrapa Semiárido

T1 (113 DAP-19.0° Brix),
T2 (120 DAP-21.0° Brix)
T3 (127 DAP-22.2° Brix).

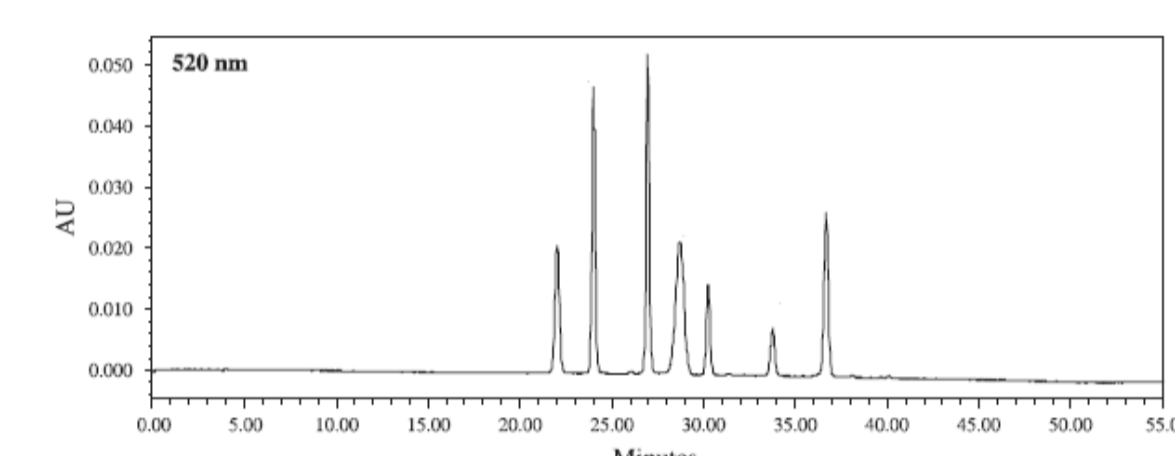


1 mL of experimental wines was filtered through a 0.45 µm nylon membrane

Injection Volume
10 µL



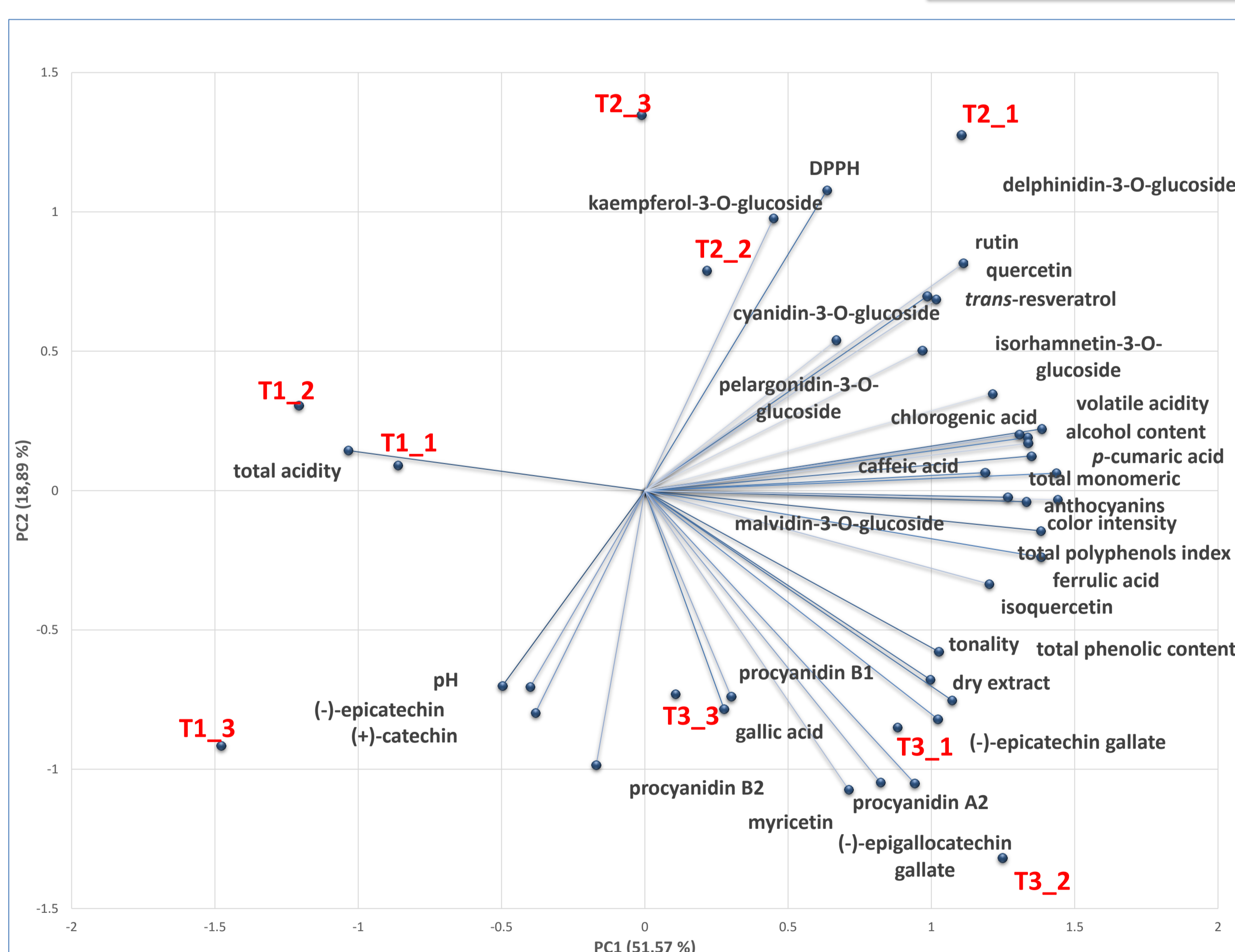
High performance liquid chromatography (HPLC) simultaneously coupled to diode array (DAD) and fluorescence (FLD)



24 phenolic compounds were determined (Natividade et al. 2013)

Figure 1: Experimental scheme

RESULTS AND DISCUSSION



Total phenolic content in wines ranged from 156.1 mg/L (T1) and 234.1 mg/L (T3), with significant difference amongst them ($p > 0.05$). Principal Component Analysis (PCA) performed on experimental Syrah wines samples resulted in the first two PC explaining 70.46 % of the total variance. In the first PC (PC1 – 51.57 %), the total polyphenols index, the total monomeric anthocyanins, alcohol content, ferrulic acid, chlorogenic acid, *p*-coumaric acid, pelargonidin-3-O-glucoside, and malvidin-3-O-glucoside contents had positive correlations and higher weightings. The second PC (PC2- 18.89 %) correlated positively with the DPPH assay and kaempferol-3-O-glucoside. Caffeic acid, procyanidin B1, isoquercetin, (+)-catechin and malvidin-3-O-glucoside were the main compounds determined in the samples.

By the Pearson correlation, out of the twenty-four phenolic compounds quantified, only quercetin ($r = 0.697$ e $p = 0.005$), *trans*-resveratrol ($r = 0.567$ e $p = 0.019$), rutin ($r = 0.534$ e $p = 0.025$), delphinidin-3-O-glucoside ($r = 0.454$ e $p = 0.046$) and cyanidin-3-O-glucoside ($r = 0.444$ e $p = 0.050$) displayed a significant positive correlation with antioxidant activity by DPPH assay.

CONCLUSIONS

In general, statistical analysis has shown which compounds were the most related with antioxidant activity and which compounds had higher weightings in the principal component analysis. The results showed that stage of ripeness T3 favored an increasing in the total phenolic concentration in Syrah wine of the São Francisco Valley, however, the wine with higher antioxidant activity was T2.

REFERENCES

[1] M. M. P. Natividade, L. C. Corrêa, S. V. C. Souza, G. E. Pereira, L. C. O. Lima, *Microchemical Journal*, 2013,110, 665-674

ACKNOWLEDGEMENTS