

# PHENOLIC COMPOSITION OF WINES MADE WITH THE SYRAH GRAPE UNDER DOUBLE PRUNING IN THE BRAZILIAN HIGH-ALTITUDE CERRADO

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## Introduction

Wine growing has emerged as a significant development opportunity for agribusiness in several new regions of Brazil, including the Federal District, where over ten wineries have been established in the past five years. One key technique contributing to this growth is the double pruning system, a sustainable method that enabled grape cultivation in this emerging region. This method involves trimming the growing shoots during the summer and positioning the fruit ripening phase during a cooler period of the season, allowing the grapes to ripen more thoroughly. The Syrah variety has shown excellent adaptation to this cycle management model. This study aimed to evaluate the physical-chemical and phenolic composition of wines made from the Syrah variety in two harvests, 2022 and 2023, to understand the behavior of the phenolic and technological ripening process of grapes on vines implemented in the federal district.

## Materiais e Métodos

Commercial wines from the Syrah variety were collected for the conduction of the study, being 6 samples from the harvest 2023 and 3 samples from the harvest 2022. The analyses were performed at the Oenological Reference Laboratory of the Secretary of Agriculture of the State of Rio Grande do Sul (LAREN/SEAPI), at Caxias do Sul - Brazil. The total phenolic compounds were analysed by direct reading at 280 nm, in a Prove 600 Spectroquant (Merck Millipore), based on the Ribière-Gayon (2003) methodology. The isolated polyphenols were determined by HPLC. For evaluating the results we used the GraphPad Prism version 10.0. The years were compared by t student test and the different samples were compared by ANOVA, pos hoc test. We considered the statistical difference  $p < 0.05$ .

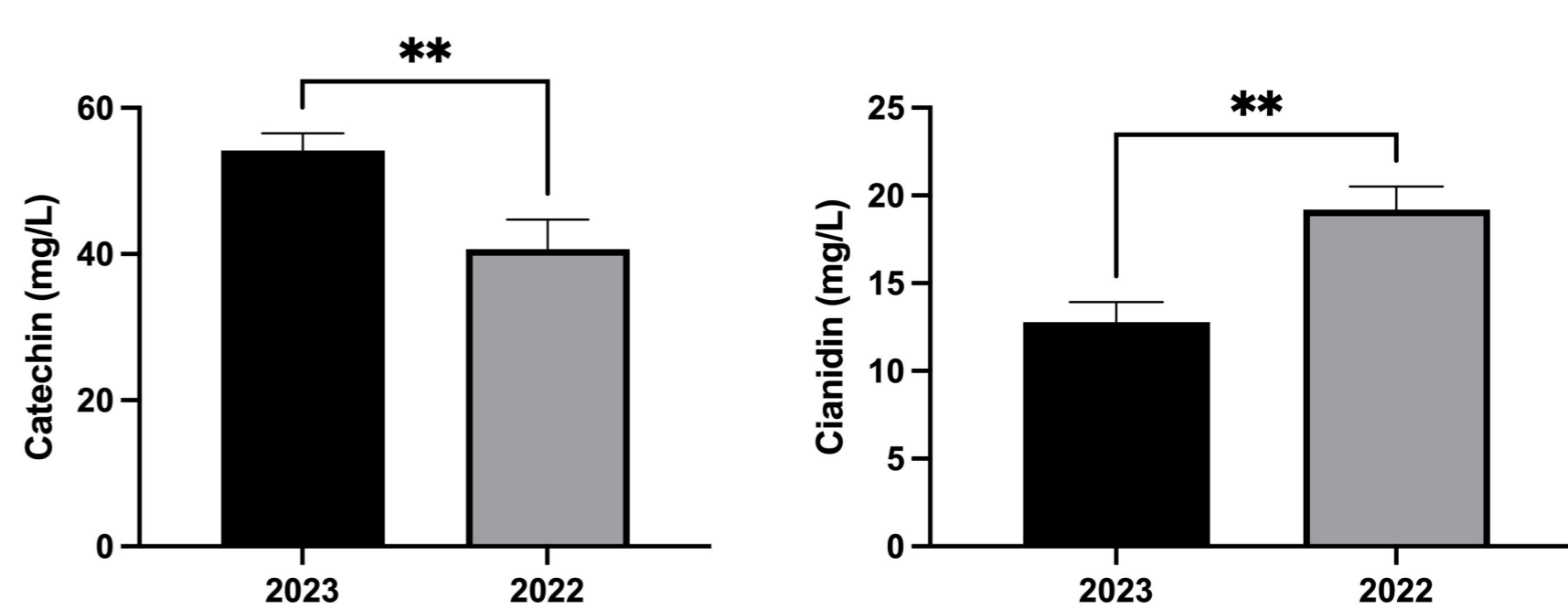
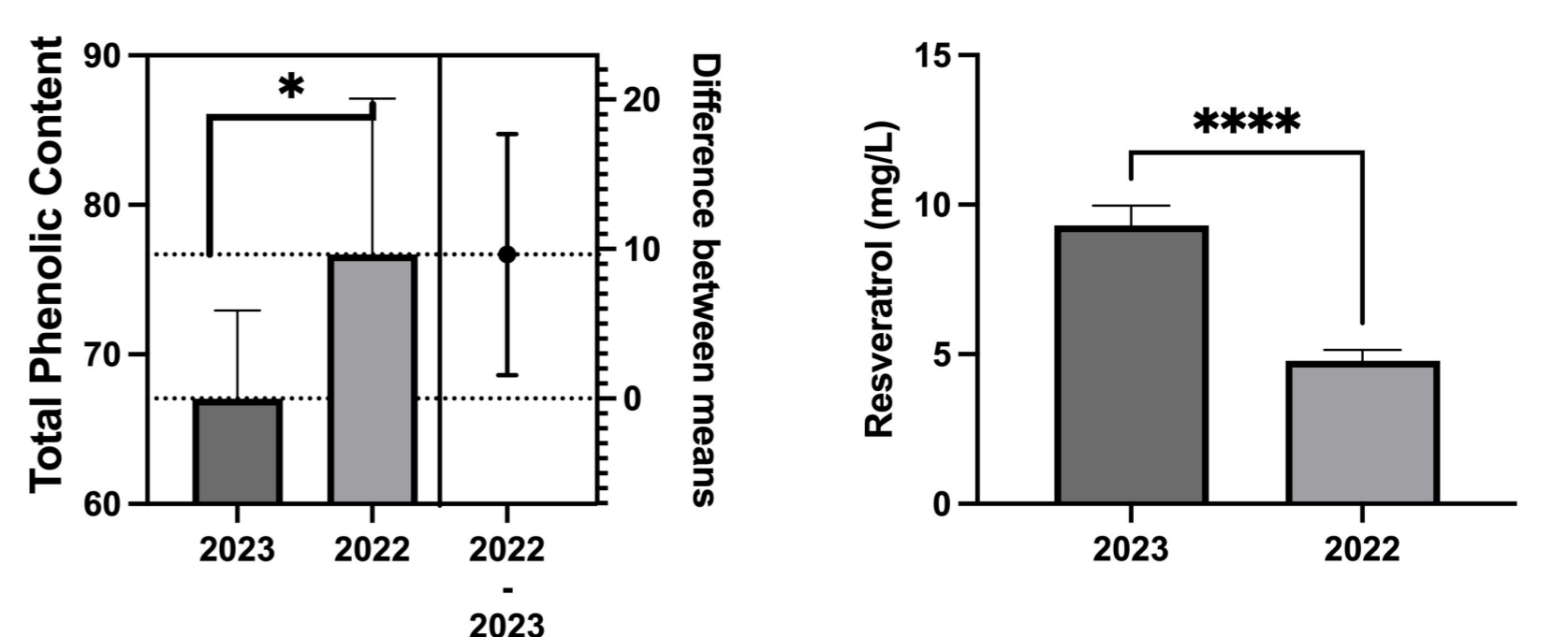


## Conclusion

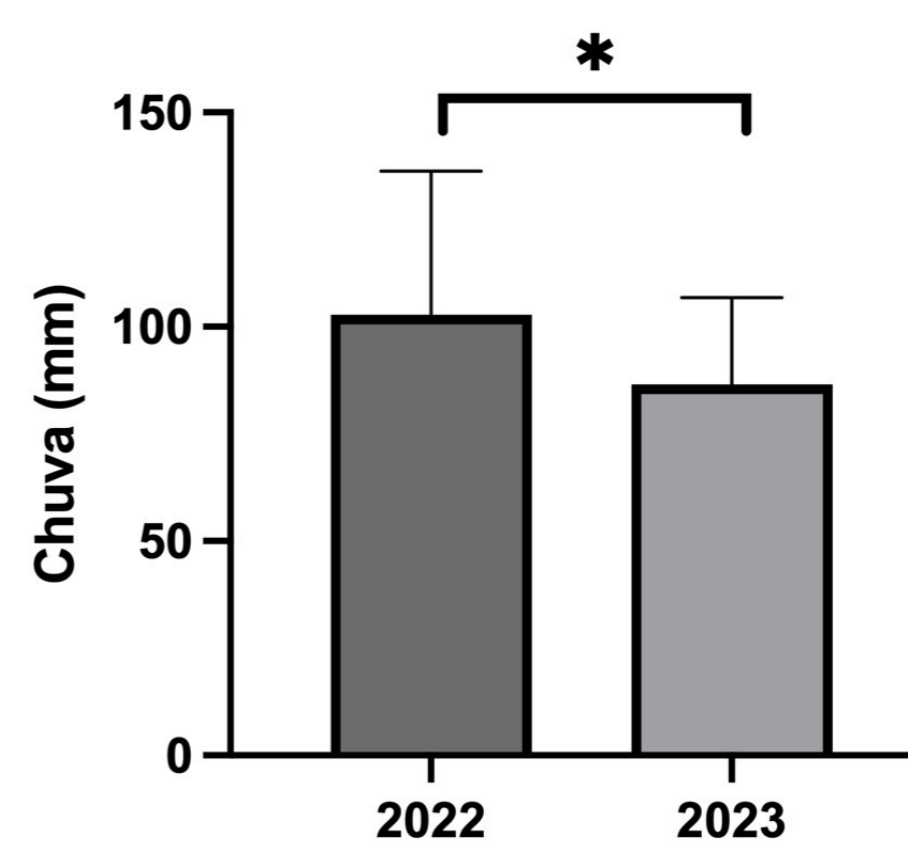
Different factors could explain these results, such as the thermal range present in this region, located around 1,000 m above sea level, which can reach up to 20°C/day. Also, in the winter, time to harvest, at 2022 (0.00mm) the levels of rain were lower than 2023 (20mm). More studies are needed to observe possible intra-region variations and the behavior of different cultivars. However, the results obtained are auspicious regarding the quality of the wines in question, demonstrating a balance between the main factors involved, such as climate, soil, and relief. These characteristics will certainly be important for defining the terroir of this region, seeking its own identity, which will be constructed based on these and other analyses.

## Resultados

We observed that wines made from different harvests showed differences in total phenolic composition, wines from the 2022 harvest presented higher values ( $76.68 \pm 10.42$ ) than the 2023 harvest ( $67.05 \pm 5.89$ ),  $p = 0.0221$ . Surprisingly, the resveratrol content showed a different behavior, wines from harvest 2023 ( $9.36 \pm 0.66$  mg.L<sup>-1</sup>) showed higher levels than the harvest 2022 ( $4.77 \pm 10.36$  mg.L<sup>-1</sup>) ( $p < 0.0001$ ). The same difference was observed for catechin levels, harvest 2023 ( $54.20 \pm 2.31$ ) showed higher levels than harvest 2022 ( $40.69 \pm 4.07$  mg.L<sup>-1</sup>), ( $p = 0.0065$ ). Different from these results and similar to the phenolic total compounds, the cyanidin levels showed lower levels in 2023 harvest ( $12.78 \pm 1.14$  mg.L<sup>-1</sup>) than 2022 harvest ( $19.19 \pm 1.32$  mg.L<sup>-1</sup>), ( $p = 0.036$ ).



Total phenolic, resveratrol, catechin and cyanidin content in Syrah wines from different harvest (2022 and 2023) in double pruning system, call winter's wines. Comparison by t test, considering  $p < 0.05$  as significant. \* $p < 0.05$ ; \*\* $p = 0.01$ ; \*\*\*\* $p < 0.001$



Total amount of raining (mm) from different harvest (2022 and 2023) in double pruning system, call winter's wines. Comparison by t test, considering  $p < 0.05$  as significant. \* $p < 0.05$ .

## Agradecimentos

