EVALUATION OF A PECTIN RINCE PROCEDURE FOR IMPROVING ACIDITY, BITTERNESS AND ASTRINGENCY EVALUATION OF RED WINES BY A TRAINED PANEL

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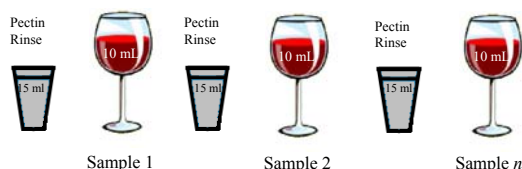E-mail : kmuller@uchile.cl

Introduction

Astringency is a long lasting sensation that is perceived increasingly intense upon repeated ingestion to astringent foods or beverages. The use of a pectin rinse (1 g/L) between successive sips has been shown to reduce this carry-over effect in evaluation of red wine astringency by time-intensity methodology (1). The effectiveness of this protocol for improving the performance of the sensory panel for acidity, bitterness and astringency assessment in descriptive analysis of a red wine was evaluated.

Materials and Methods

DESCRIPTIVE SENSORY EVALUATION

19 paid subjects (6 men and 13 women, between 19 and 57 years of age) were trained in descriptive analysis for the attributes of acidity, astringency and bitterness in 5 sessions of two hours each. During the formal sensory evaluation, conducted in individual computerized booths, they rated the intensity of acidity, bitterness and astringency of 6 samples of red wine with and without the pectin rinse protocol in two different sessions using an unstructured 10 cm line scale and INAO standardised black wine glasses. The samples presented were: a pH 3.9 petit verdot wine (control wine), the pH 3.9 wine added with 0.5 g/L of a lyophilized grape stem extract (previously used as an astringent standard), two samples of a pH 3.5 wine obtained from the control wine by bipolar membrane electrodialysis (acidic wine), and two samples of the pH 3.5 wine added with 10 mg/L of quinine HCL (bitter wine). Samples were presented with a monadic service.

Session 1
NO SIP AND SPIT PROTOCOL
NO PECTIN RINSE

Original pH 3.9 wine | Astringent pH 3.9 wine | Acid pH 3.5 wine | Bitter pH 3.5 wine

Session 2
WITH SIP AND SPIT PROTOCOL & PECTIN RINSE

Original pH 3.9 wine | Astringent pH 3.9 wine | Acid pH 3.5 wine | Bitter pH 3.5 wine

SIP AND SPIT PROTOCOL WITH A PECTIN RINSE (1 g/L)

Pectin Rinse 15 ml | 10 mL Sample 1
Pectin Rinse 15 ml | 10 mL Sample 2
Pectin Rinse 15 ml | 10 mL Sample n

Judges sipped a 15 ml sample of 1g/L citrus peel pectin (FLUKA 76280), expectorated at 15 seconds, and 15 sec later sipped the wine sample (10 ml), which was then expectorated 10 seconds later. The Judges then rated maximum astringency, bitterness and acidity on an unstructured 10-cm line scale, anchored by the terms low and high, and continued with the pectin rinse protocol before the next sample of wine after 40 to 60 sec. .
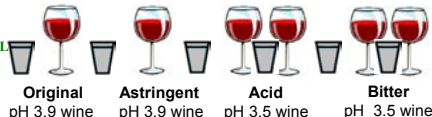
Results

Analysis of Variance (ANOVA) (all products)

	Probability No pectin rinse	Probability With pectin rinse	Number of judges	Eliminated judges
Acidity	0.0893	**0.0026 ****	19	0
Astringency	0.5166	**0.0343 ***	19	3
Bitterness	0.5877	**0.0453 ***	19	5

* significative at 5 %   ** significative at 1 %   P.P.D.S at 5%

Comparison of acidity , astringency and bitterness between samples evaluated with the pectin rinse protocol

ACIDITY		
Sample	**Average**	**Groups**
pH 3.5 bitter	6.65	A
pH 3.5	6.42	A
pH 3.5	6.33	A
pH 3.5 bitter	5.78	A
pH 3.9	5.40	AB
pH 3.9 astringent	4.25	B

ASTRINGENCY		
Sample	**Average**	**Groups**
PH 3.9 astringent	8.17	A
PH 3.9	7.29	B
PH 3.5	7.22	B
PH 3.5	7.21	B

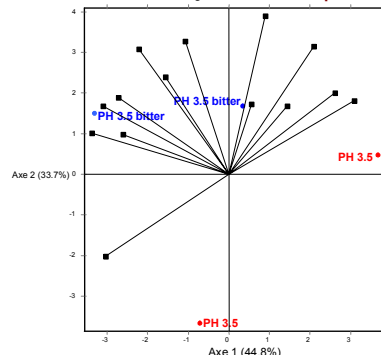| BITTERNESS		
Sample	**Average**	**Groups**
PH 3.5 bitter	6.26	A
PH 3.5 bitter	5.94	A
PH 3.5	4.91	AB
PH 3.5	4.44	B

For a better evaluation of astringency, bitter samples were excluded from statistical analysis, and for the statistical evaluation of bitterness, astringent and non astringent pH 3.9 wines were excluded. Three to five panellists were excluded from statistical analysis for the attributes of astringency and bitterness based on training performances, panel validation and on correlation circles

Judge correlation for bitterness ratings with and without a pectin rinse protocol

A.C.P. Product/Judge for bitterness **without pectin rinse**
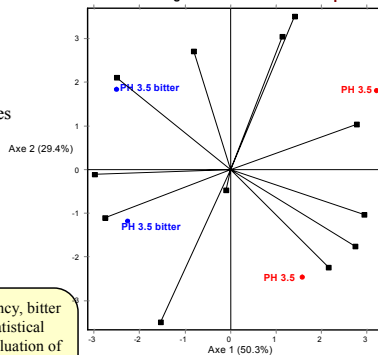
A.C.P. Product/Judge for bitterness **with pectin rinse**

Conclusions

The global ANOVA analysis showed no significant discrimination of the panel for acidity, bitterness or astringency when the wines were evaluated without a pectin rinse. The discrimination capacity and homogeneity of the panel in the evaluation of acidity, bitterness and astringency of red wine samples were significantly improved with the use of a sip and spit pectin rinse protocol.

References

(1) Colonna, Adams, Noble, *AJGWR*, 10, 26-31, 2004.

Acknowledgements

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