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The sensorial perception of astringency : prediction models based on UV spectroscopy

Jean Claude Boulet, Corinne Trarieux, Jean Marc Souquet, Marie-Agnès Ducasse, Soline Caille, Alain Samson, Pascale Williams, Thierry Doco, Veronique Cheynier

► To cite this version:

Jean Claude Boulet, Corinne Trarieux, Jean Marc Souquet, Marie-Agnès Ducasse, Soline Caille, et al.. The sensorial perception of astringency : prediction models based on UV spectroscopy. 9. Symposium In Vino Analytica Scientia, 2016, Trente, Italy. 2016, In Vino Analytica Scientia. hal-01984282

HAL Id: hal-01984282

<https://hal.science/hal-01984282>

Submitted on 16 Jan 2019

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Jean-claude Boulet^{*1}, Corinne Trarieux¹, Jean-Marc Souquet¹, Marie-Agnès Ducasse², Soline Caillé¹, Alain Samson¹, Pascale Williams¹, Thierry Doco¹, Véronique Cheynier¹.

¹ INRA, UMR1083 Sciences pour l'Oenologie, F-34060 Montpellier, France.

² IFV, UMT Qualinnov, F-11430 Gruissan, France.

* bouletjc@supagro.inra.fr

Astringency is a major characteristic of wines sensorial perception. It is ascribed to tannins. Astringency is assessed by sensory analysis, which is time-consuming and lacks of repeatability with little and not trained panels. So alternative methods such as the Gelatine Index, the Bovine Serum Albumine assay (BSA), the Methyl-Cellulose Assay or the Saliva Precipitation Index have been proposed.

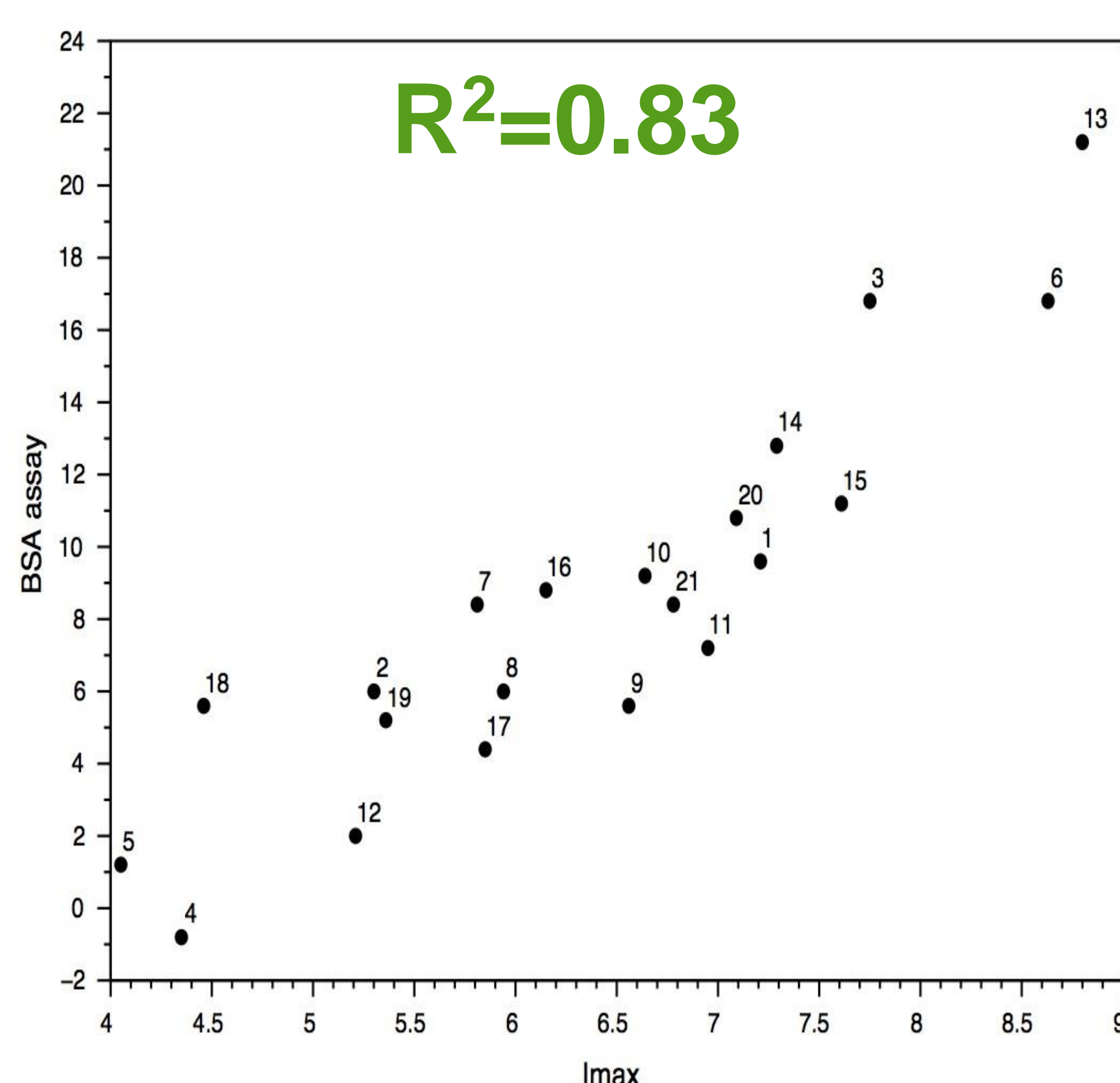
This study: (1) evaluates the capability of the BSA assay to predict astringency;
(2) proposes alternative methods which involve: wines absorbance at 230nm; total oligosaccharide and polysaccharide content.

EXPERIMENTATION

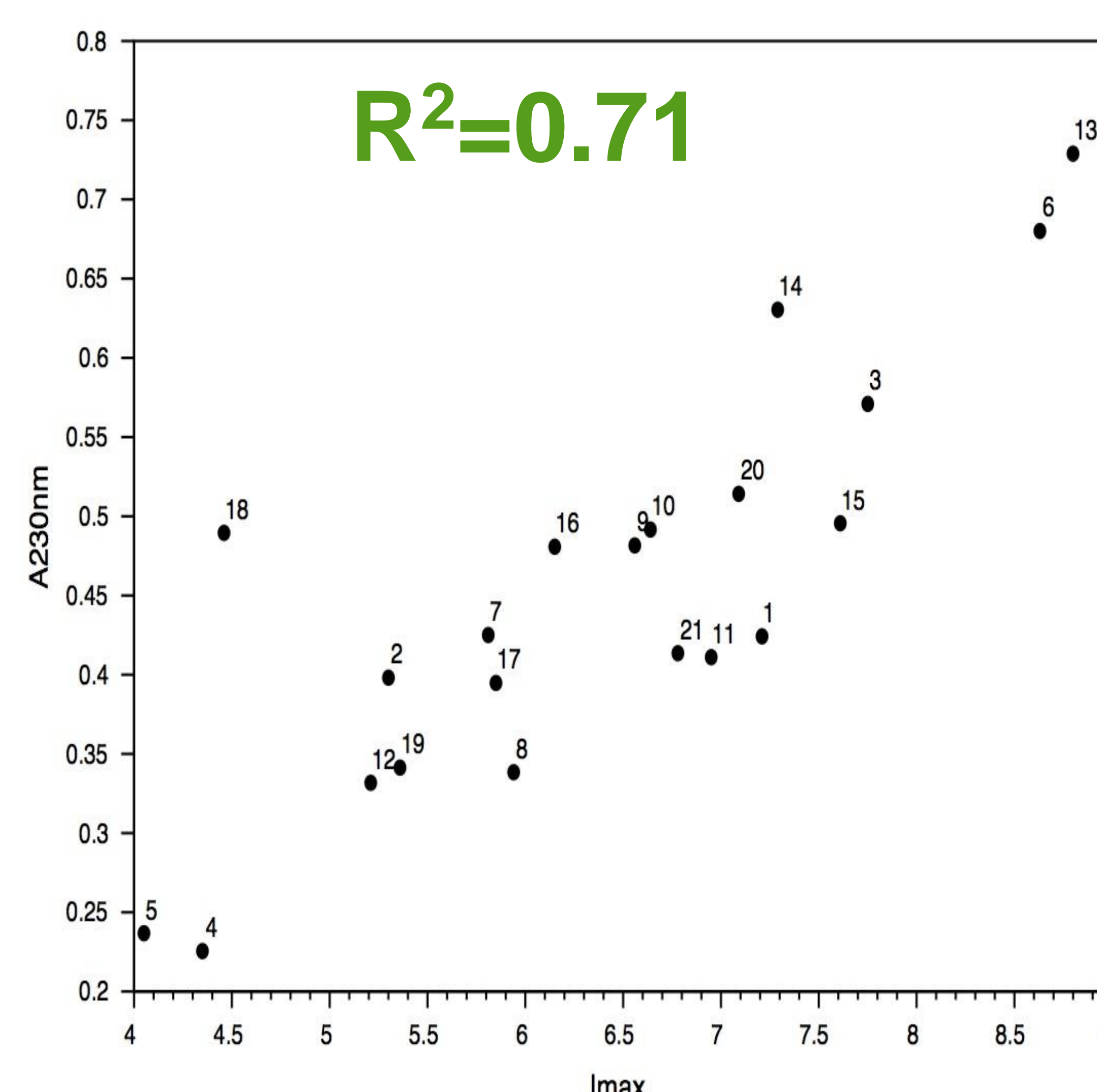
Twenty-one wines of different grapes and vintages were selected, mainly from the Languedoc-Roussillon region. Sensory analysis was performed with a panel of 20 judges, selected and trained to astringency description. Chemical analysis was also performed: classical parameters, polyphenols by HPLC-DAD after phloroglucinolysis, oligosaccharides and polysaccharides after separation by gel permeation chromatography. Then the BSA assay was chosen and evaluated.

Astringency (noted I_{max}) was predicted by BSA and by all models from 1 to 4 variables. The best ones according to their R² and their error of cross-validation are reported below.

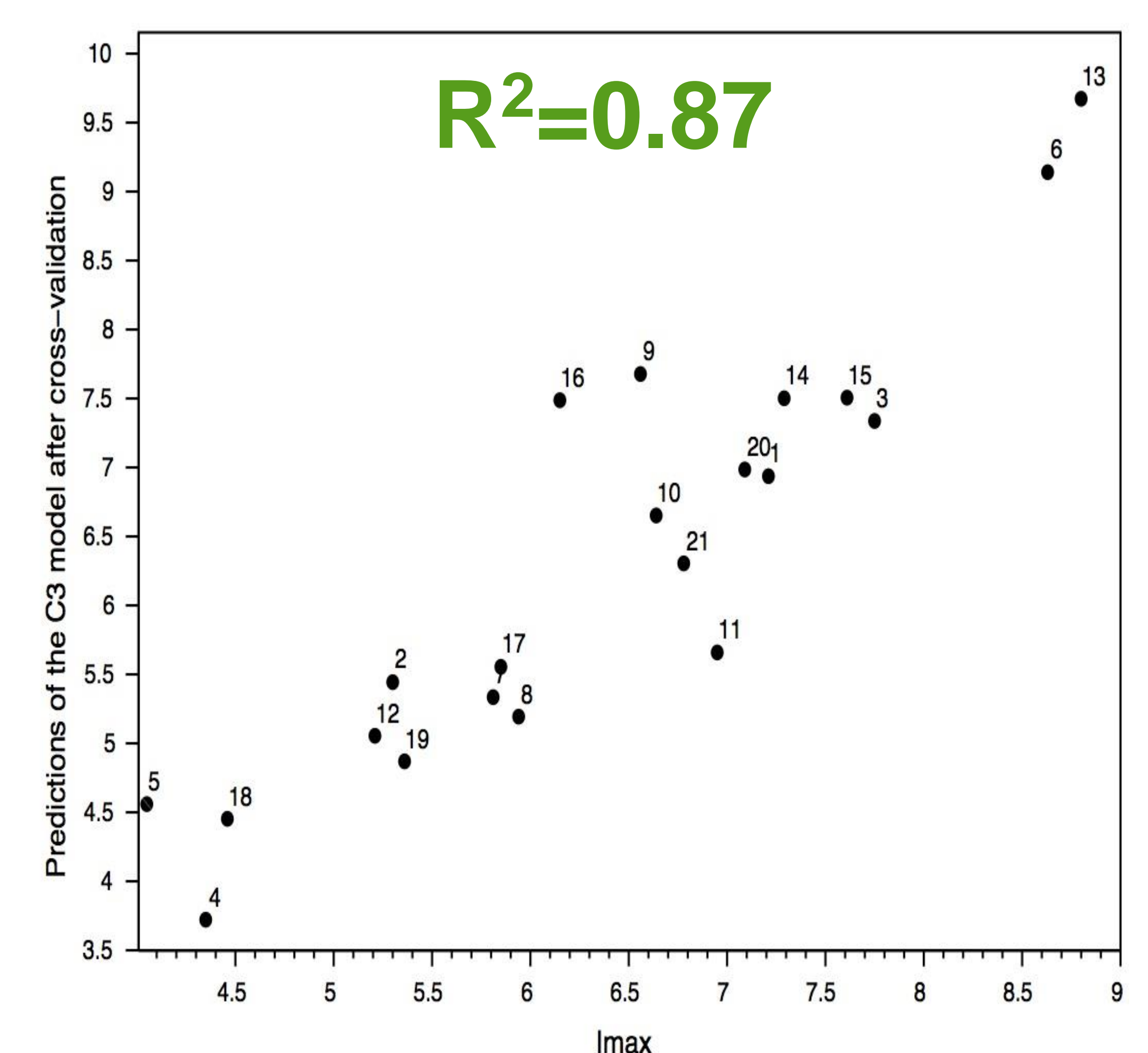
RESULTS



BSA assay



Abs. 230 nm



I_{max} =

$$10.2 * A_{230} + 0.0096 * \text{oligosaccharides} - 0.0036 * \text{polysaccharides}$$

CONCLUSIONS

- The BSA assay confirms its capability to yield a good prediction of astringency.
- The absorbance at 230nm is proposed for a quick estimation of astringency
- Polysaccharides decrease astringency, as already reported
- We observed that oligosaccharides have a direct effect to increase astringency.

REFERENCES

Boulet, J-C., Trarieux, C., Souquet, J-M., Ducasse, M-A., Caillé, S., Samson, A., Williams, P., Doco, T., Cheynier, V., Models based on ultraviolet spectroscopy, polyphenols, oligosaccharides and polysaccharides for prediction of wine astringency, Food Chemistry (2015), doi: <http://dx.doi.org/10.1016/j.foodchem.2015.05.062>