

Assessment of different grape extraction methods for the evaluation of grape to wine phenolic correlations

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Background

Phenolics are chemical compounds that give red wines their colour and structure. They influence colour stability and ageing potential of wines. Grape phenolic content is an important quality factor that influence the appearance and mouthfeel of red wines.

Various phenolic assays are used to determine phenolic maturity in red grapes. These assays are aimed at helping determine harvesting date and winemaking strategies during red wine production.

Aim

The aim of this study is to develop an adjusted phenolic sample preparation and extraction protocol for red grapes with reduced extraction time.

Methodology

Grape extractions were done in duplicates using different methods namely Glories, Iland, Adjusted Iland, Hand crush and Machine crush method. Grape crush, treatments and extraction times for the methods are as follows:

Extraction method	Grape crush	Treatment	Extraction time
Iland	Homogenate	50% EtOH v/v	1 hour
Mod Iland	Microwaved homogenate	50% EtOH (pH 2) v/v	30 minutes
30 min Iland	Microwaved homogenate	50% EtOH (pH 2) v/v	30 minutes
Hand crush	Skin crushed	15% EtOH v/v	40 hours
Machine crush	Skin crushed	Control Microwaved- 50% EtOH v/v	3 hours and 24 hours

**Highlighted methods are the adjusted methods.*

- Six grape cultivars namely Pinotage, Cabernet Sauvignon, Merlot, Shiraz, Cinsualt and Pertit Verdot were used.
- Grapes were collected in 42 different vineyards from across 15 different farms.
- Wines in duplicates were made from every vineyard.
- Various spectrophotometric phenolic analyses performed on grapes and wines

Conclusion

- The study seeks to develop an assay with reduction of extraction time.
- Mod Iland method extraction seems to be reduced by 30 min for anthocyanins
- Variances have been observed in the different extraction methods for the measured phenolic parameters.
- Poor correlations between the grapes and wines have been observed.

Results

Phenolic content for the grape extractions is reflected on the figures below. Significant variances in the grape samples for the measured parameters on the different extraction methods were observed.

Fig 1: Different Iland analyses of the grape extracts

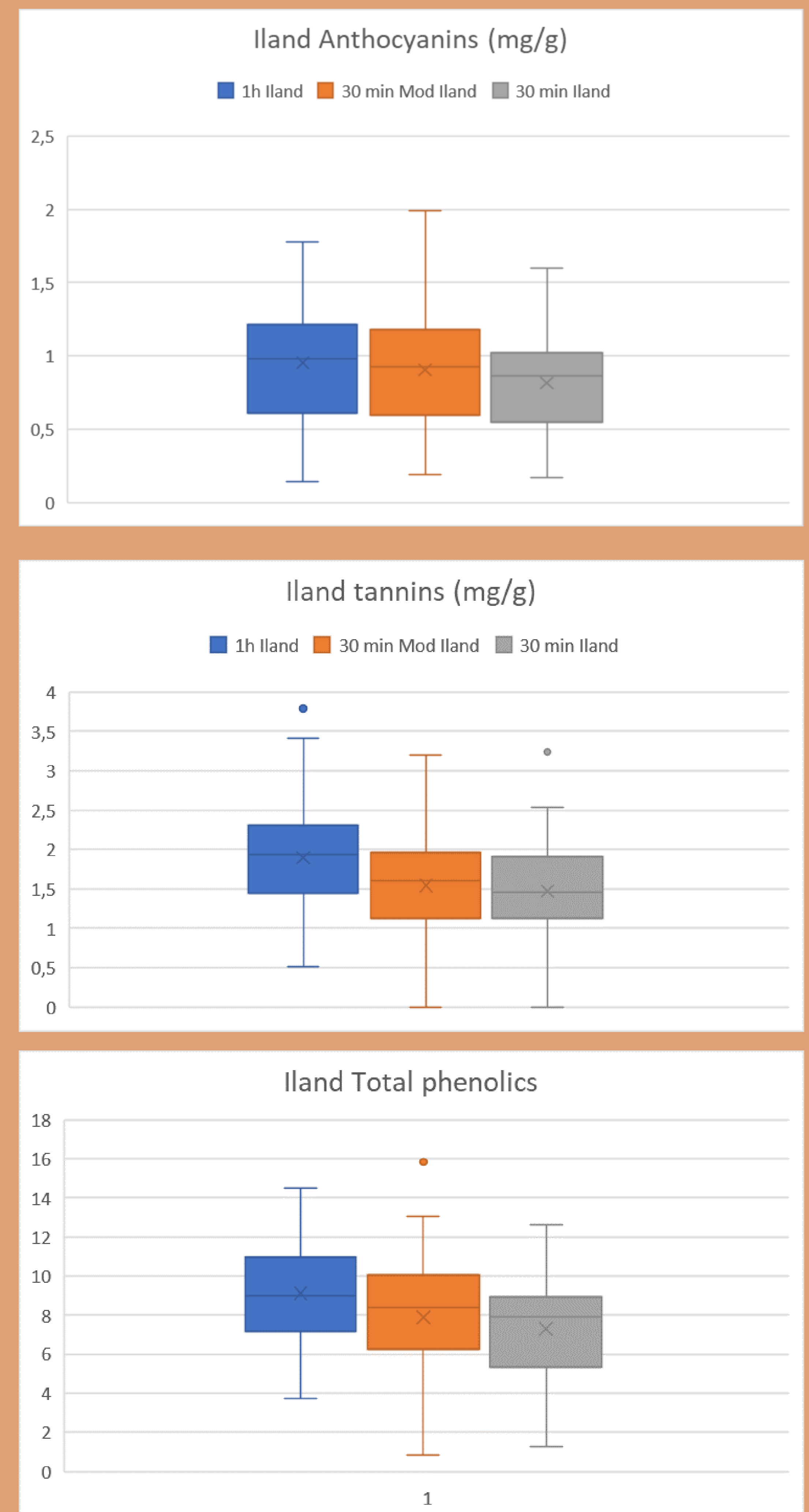
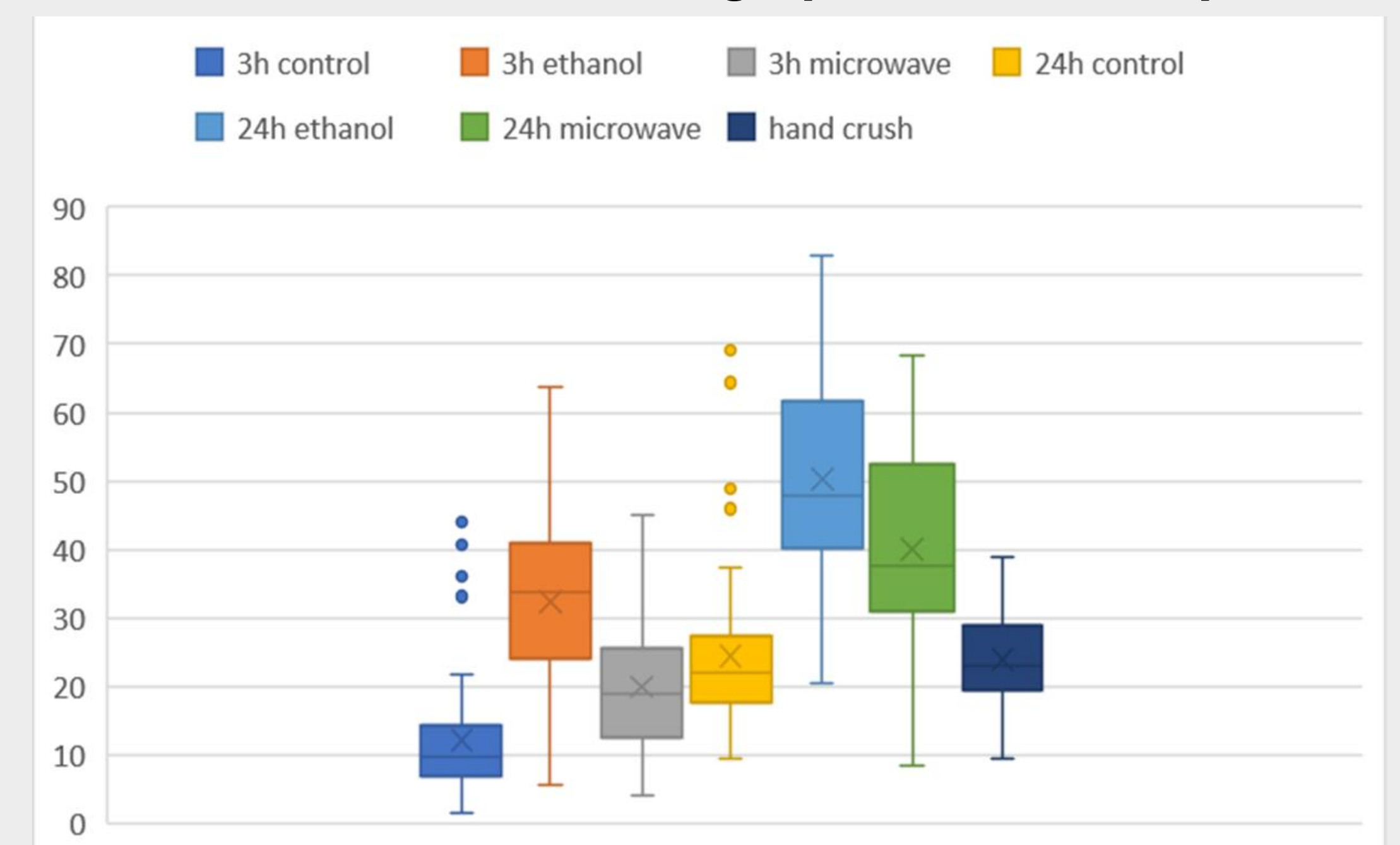


Fig 2. Machine and hand crushed grape extract total phenolics



Preliminary results showed poor correlations between the grapes and wines.