INTRODUCTION

Faulty wines in the retail space can have a detrimental impact on the brand, retailer, and consumer confidence. Identifying faulty products before they reach the consumer mitigates the potential impact on reputation and financial costs. (Ridgway et al., 2010). Contamination due to microorganisms and/or insects during the wine making process can evolve into wine sensory faults, and if unidentified, reach the consumer. For this study, two chemical markers, which is sufficient concentrations can render a wine faulty, were considered: 4-Ethylphenol (4-EP) and 2-Isopropyl-3-methoxypyrazine (IPMP). These two chemical markers are associated with Brettanomyces and multicolored Asian lady beetle wine faults, respectively (Romano et al., 2009, Pickering et al., 2006).

OBJECTIVES

The purpose of this research was to determine aromatic sensory Detection Threshold (DT) and Rejection Threshold (RT) levels that winemakers can employ to assist in evaluating an Ontario Riesling.

METHODS AND MATERIALS

Chemical Reagents

The chemical standards 4-ethylphenol and 2-isopropyl-3-methoxypyrazine were purchased from Sigma-Aldrich (Oakville, Canada).

Wine

The wine used for this study was a commercially available 2012 Ontario Riesling.

Sensory Analysis

The DT and RT were determined using a modified same-different methodology. A total of 365 samples was presented to a panel comprised of 73 experienced and trained wine assessors. Using a randomized block design each assessor was presented a reference sample together with wine samples spiked with a single insect at each concentration level. Assessors were asked to: (1) note each spiked sample and compare it with the reference “unspiked” sample to determine if the samples were different, if so, identify the specific wine fault and (2) if the identified spiked sample was acceptable for sale.

RESULTS 4-EP

Table 1. The proportion of assessors that identified 4-EP at four different concentrations, with groupings from a Marascuilo procedure following a significant chi-squared test (n=0.05).

Table 2. The proportion of assessors that accepted 4-EP at four different concentrations, with groupings from a Marascuilo procedure following a significant chi-squared test (n=0.05).

RESULTS IPMP

Table 3. The DT and RT of 4-EP in an Ontario Riesling wine.

Table 4. The proportion of assessors that identified IPMP at four different concentrations, with groupings from a Marascuilo procedure following a significant chi-squared test (n=0.05).

Figure 1. Proportion of assessors (n=73) that correctly identified a difference for wines spiked with increasing concentrations of 4-EP.

Figure 2. Proportion of assessors (n=73) that accepted wines with increasing concentrations of 4-EP compared with those that were able to correctly identify the fault as 4-EP or Brett.

Figure 3. Comparison of the proportion (n=73) of assessors that correctly identified a difference versus the proportion of assessors that rejected the wine containing 4-EP.

Figure 4. Proportion of assessors (n=73) that correctly identified a difference for wines spiked with increasing concentrations of IPMP.

Figure 5. Proportion of assessors (n=73) that correctly identified a difference for wines spiked with increasing concentrations of IPMP compared with those that were able to correctly identify the IPMP fault.

Figure 6. Comparison of the proportion (n=73) of assessors that correctly identified a difference versus the proportion of assessors that rejected the wine containing IPMP.

REFERENCES


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