

Weinakademie Österreich

D7 Weinakademiker Thesis

“Comparative Analysis of Wine Purifiers: Efficacy in Reducing Biogenic Amines and Sulfites”

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Abstract

Motivation:

During my education at the Weinakademie Österreich, I was frequently asked by friends and acquaintances, “*Which wine should I drink or avoid to prevent headaches?*” Despite having read various articles on the topic, I struggled to provide a definitive answer, especially as someone who personally experiences migraine attacks. While the literature proposes mechanisms for adverse reactions caused by wine and offers precautions for wine producers, there is limited information on the effectiveness of wine purifiers marketed to end consumers for alleviating headaches and other adverse effects like allergies. The motivation of this thesis was to address this gap by evaluating the effectiveness of these wine purifiers.

Objective:

Objective of the thesis is to assess the efficacy of four different types of wine purifiers by measuring and comparing the post purification biogenic amine and sulfite levels of the wines.

Methodology:

Using a Turkish red wine as the test sample, biogenic amines and sulfites were analyzed using High-Performance Liquid Chromatography (HPLC) and spectrophotometry, respectively. The statistical analysis was performed with IBM SPSS Statistics 30.0.0. software.

Content:

This thesis provides an overview of biogenic amines and sulfites, including their chemical structures, presence in wine, and the adverse symptoms associated with these compounds. It examines the composition, properties, and mechanisms of action of commercially available wine purifiers. The results of biogenic amine and sulfite analyses are presented and supported with detailed charts and tables. Finally, the findings are discussed, and the study concludes with recommendations based on the observed outcomes.

The presence of biogenic amines and sulfites in wine, while regulated to some extent, remains a concern for individuals sensitive to these compounds. This study evaluates the efficacy of four different types of wine purifiers—wine wands, wine sachets, wine liquids, and wine filter boxes—in reducing levels of biogenic amines and sulfites. Results indicate that none of the tested purifiers effectively reduced histamine levels. Notably, spermidine levels decreased in all purifier-treated groups, while significant reductions in tryptamine levels were observed only with the wine liquid and wine filter box. Among the purifiers, only the wine liquid significantly reduced free and total sulfite levels. The other purifiers showed no statistically significant impact on sulfites. While the wine liquid demonstrated some efficacy in lowering sulfite levels, its inability to fully eliminate these compounds and the persistence of biogenic amines raise questions about its overall effectiveness.

This study underscores the limited effectiveness of commercially marketed wine purifiers in achieving their stated objectives and emphasizes the need for further research, including larger sample sizes and diverse grape varieties. Improved purifier technologies and scientific validation of their claims could address consumer health concerns while enhancing the marketability of wine.

Conclusions: Within the scope of this study, wine purifiers employing different mechanisms exhibited varying effects on biogenic amine levels. While the purifiers were expected to reduce histamine levels, their most notable impact was observed in lowering spermidine levels. Among the tested purifiers, wine liquid demonstrated promise in reducing sulfite levels, offering potential benefits for sensitive consumers. However, the results suggest that most of the tested purifiers may not effectively fulfill their marketed claims of reducing biogenic amines and sulfites in wine.

Key Words: Biogenic Amines, Sulfites, Histamines, Wine Purifiers