



# QUALITY AND SAFETY CONTROL OF UNRECORDED FRUIT SPIRITS FROM SERBIA

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## INTRODUCTION

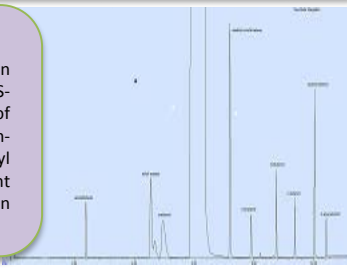
The established tradition of unrecorded, homemade fruit spirits consumption has been identified as health risk source, especially in countries located at the Balkan Peninsula, Central and Eastern Europe. Acetaldehyde may contribute to the carcinogenicity of alcoholic beverages, methanol is described to be the most common cause for surrogate toxicity, while higher alcohols have been speculated as a cause for liver cirrhosis in Eastern Europe. Hence, homemade fruit spirits were divided into 6 types - plum, apricot, pear, quince, apple and grape pomace and analyzed for the presence of volatiles - acetaldehyde, ethyl acetate, methanol and higher alcohols. Obtained contents were compared with the toxicological thresholds proposed by the Alcohols Measures for Public Health Research Alliance project (AMFORA).

## RESULTS

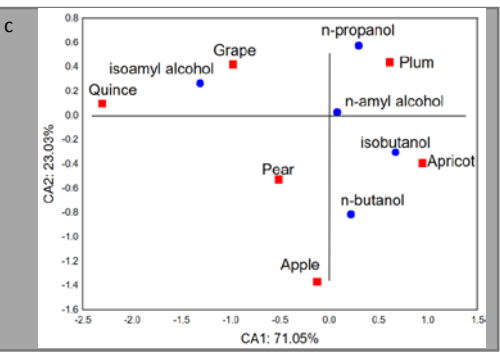
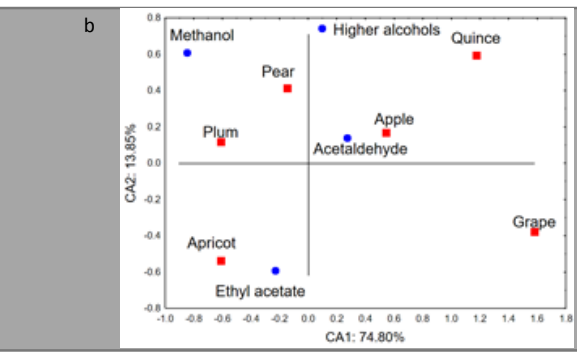
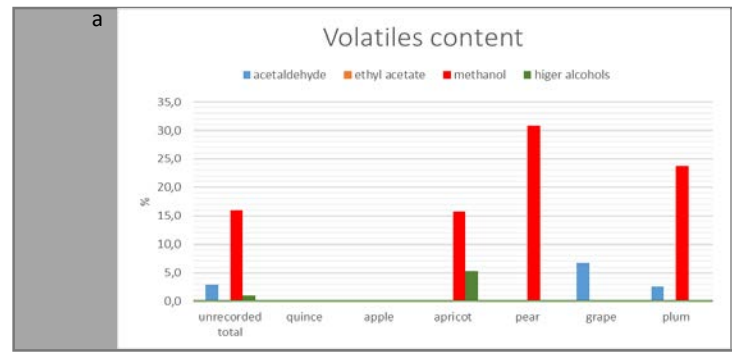
The most abundant volatile is **methanol** present up to 31% in pear samples. Quince and apple spirit samples met all the AMFORA requirements for the analyzed volatiles, while up to almost 7% of grape samples and up to 3% of plum samples contained probable human carcinogen **acetaldehyde**. **Higher alcohols** were present only in apricot spirits (5.3%) (picture a).

## MATERIAL AND METHODS

A total 100 of unrecorded, homemade spirits were collected in Vojvodina (Serbia) during 2020. A rapid, sensitive and reliable HSS-GC-FID method for the quality control of fruit spirits in terms of acetaldehyde, ethyl acetate, methanol and higher alcohols (n-propanol, iso-butanol, n-butanol, iso-amyl alcohol and n-amyl alcohol) has been set up and validated. Canonical discriminant analysis (CDA) was used to find differences in volatile composition depending on the spirits origin.



The application of canonical discriminant analysis (CDA) showed that plum and apricot spirits are generally characterized by higher levels of methanol in comparison to the other examined samples, while acetaldehyde dominates in grape pomace spirits (picture b). Distribution of higher alcohols among analyzed spirits was described by the following pattern: n-propanol – plum, iso-butanol and n-butanol – apricot, iso-amyl alcohol – quince and grape pomace (picture c).



## CONCLUSION

- The obtained results suggest that control measures should be included in order to maintain the quality of homemade spirits and minimize the potential adverse health effects.
- There is a pattern in volatile profile depending on fruits used for the spirit production.