

INFLUENCE OF RASPBERRY VARIETY ON THE AROMATIC PROFILE OF RASPBERRY GEIST

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INTRODUCTION

In addition to Poland, USA and Chile, Serbia is the world's leading raspberry producer. The average annual production of raspberries in Serbia is 70,000 tons. 95% of annual raspberry production in Serbia is processed into frozen raspberries. There is a high demand for frozen raspberries on the world market. After maize, frozen raspberries are the second most important agricultural product that were exported from Serbia.

Only 5% of annual raspberry production is used for fresh consumption and processing into other products. Raspberries have low content of fermentable sugars. Therefore, low yield of alcohol can be obtained by fermentation and distillation. Because of the price of raw materials and low yields of alcohol, raspberry brandy is very expensive.

Raspberries have a specific, fine, but very delicate aroma. It is difficult to preserve and harmonize aromatic components from fruits with volatile compounds formed during fermentation (higher alcohols, esters, acids...). Because of the specific aroma, raspberries are a very interesting raw material for production of spirit drink obtained by maceration of unfermented berries - Geist. Raspberry Geist ranks among flavour rich fruit spirit drinks.

According to the EU Regulation, Raspberry Geist is obtained exclusively by maceration of unfermented fruits and distillation. Therefore, it does not contain volatiles formed during fermentation, but exclusively those originating from the fruits, and to a lesser extent those formed during distillation (acetals).

Fresh raspberries are very perishable. They have to be processed as soon as possible. However, during the storage of frozen raspberries, there are no significant changes in chemical composition or aroma losses. Frozen raspberries are therefore an interesting raw material for the production of spirit drinks obtained by maceration and distillation of unfermented fruits. Variety Willamette dominates (about 90%) in the assortment of raspberries in Serbia, while other varieties are much less represented - Meeker with about 5%, Tulameen less than 1%.

The quality (aroma) of Raspberry Geist depends on the raw material (variety).

The aim of this study was to analyze the content of volatile compounds in Geists produced from three varieties of raspberries that are most common in Serbia.

MATERIAL AND METHODS

Monovarietal Raspberry Geists raspberries are produced from the frozen fruits of varieties Willamette, Meeker and Tulameen according to the procedure prescribed by the EU Regulation No 110/2008..

Examination of the Raspberry Geists aromatic complex was performed by liquid-liquid extraction and analysis of the extract by GC/FID and GC/MS methods.



RESULTS

In the analysed monovarietal Raspberry Geists 113 volatile compounds were identified (Figure 1).

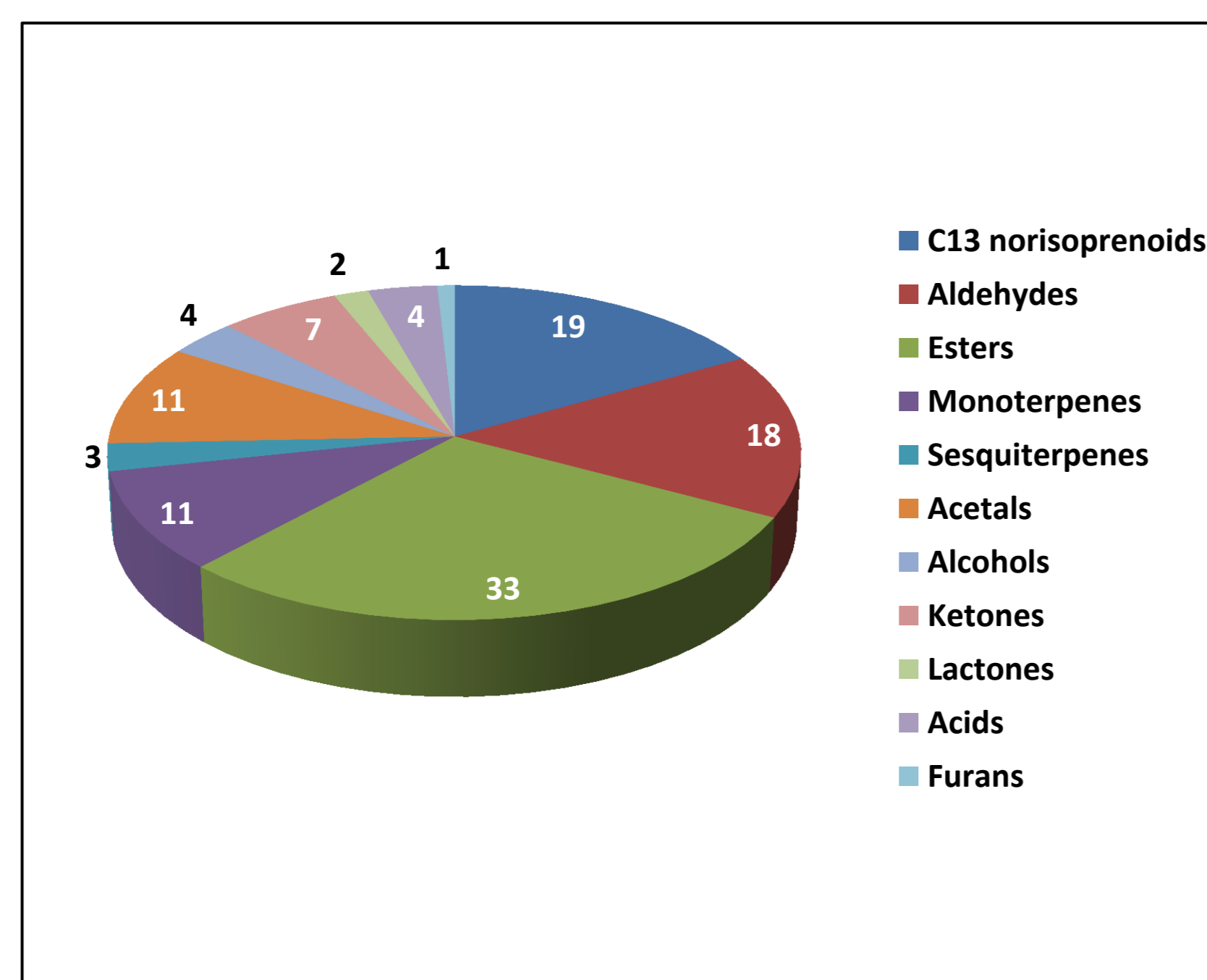


Figure 1. Number of volatile components belonging to different classes identified and quantified in Raspberry Geists

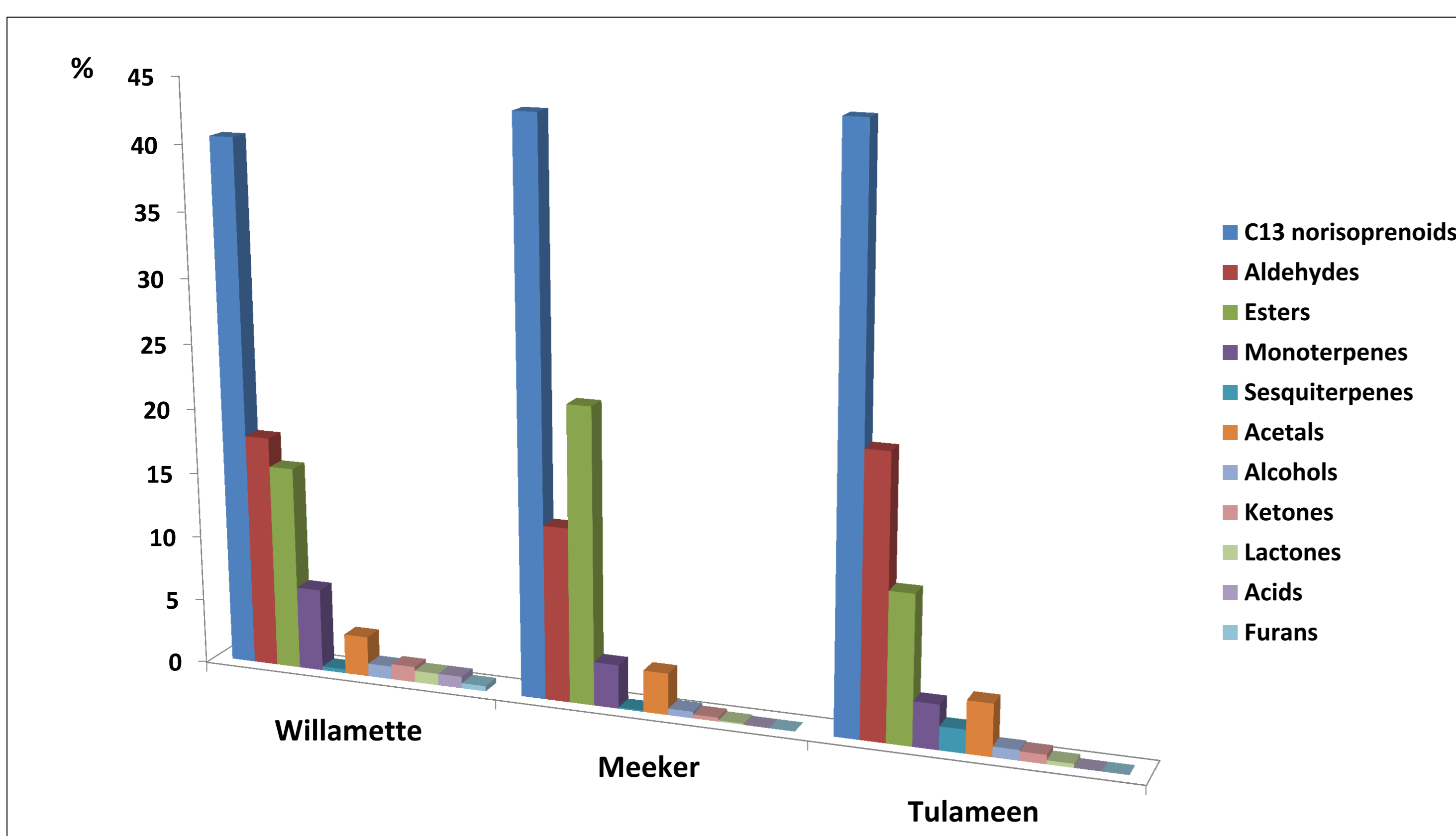


Figure 2. Aromatic profile of Raspberry Geists (%)

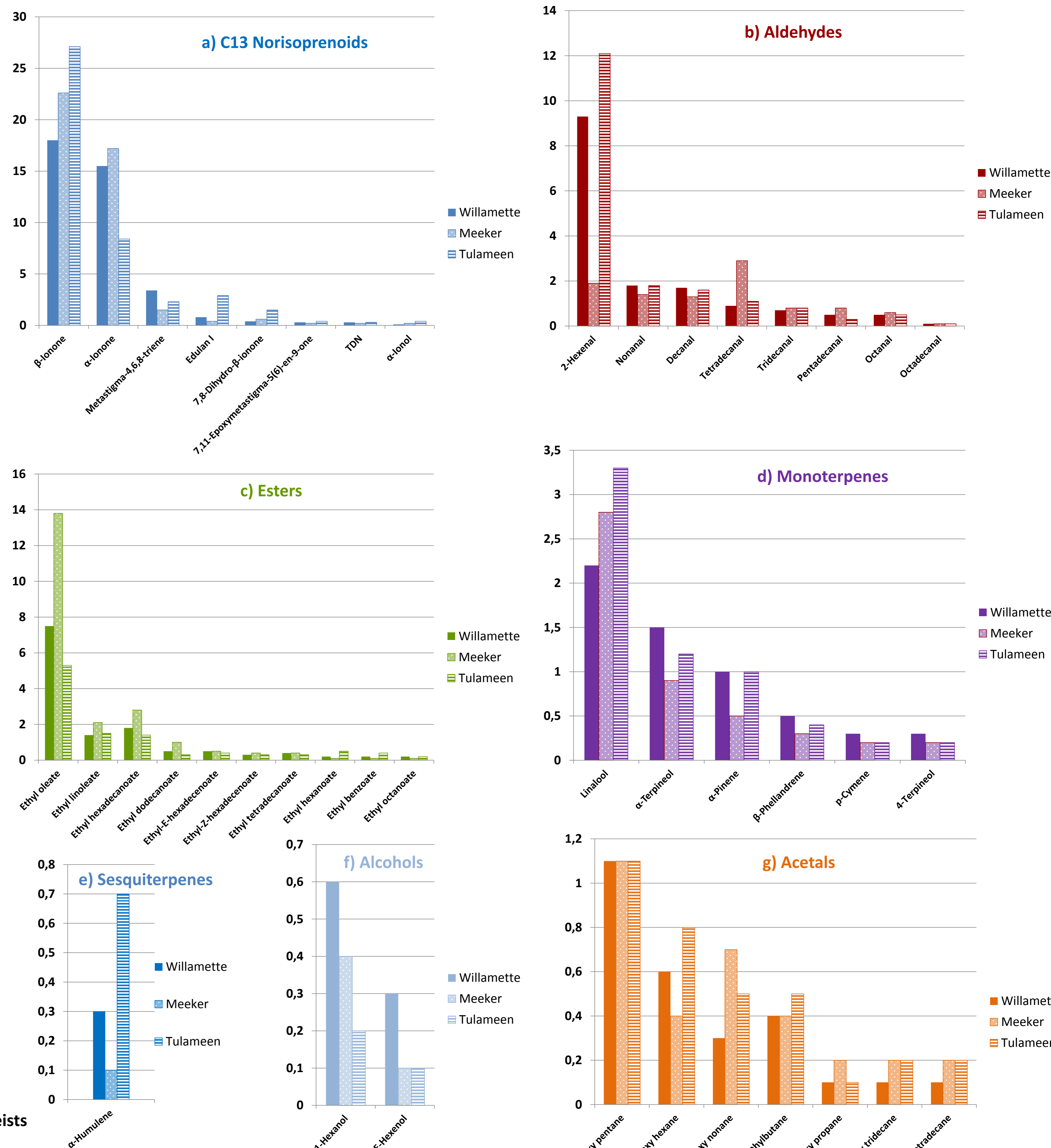
RASPBERRY GEIST

REGULATION (EC) No 110/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 January 2008 on the definition, description, presentation, labelling and the protection of geographical indications of spirit drinks and repealing Council Regulation (EEC) No 1576/89

➤ **Geist (with the name of the fruit or the raw material used) is a spirit drink obtained by maceration of unfermented fruits and berries or vegetables, nuts, or other plant materials such as herbs or rose petals in ethyl alcohol of agricultural origin, followed by distillation at less than 86 % vol.**

➤ **The minimum alcoholic strength of Geist (with the name of the fruit or the raw material used) shall be 37,5 % vol.**

➤ **Geist (with the name of the fruit or the raw material used) shall not be flavoured.**



CONCLUSION

• Among the 113 volatile components identified in monovarietal Raspberry Geists – the most numerous were esters (33 esters), C13 norisoprenoids (19 components), aldehydes (18 components), etc. Less than 50 compounds were identified in all three monovarietal Raspberry Geists.

• C13 norisoprenoids had the highest content in Geists – 40,5-44,5% (the dominant compound was β-ionone), followed by aldehydes – 13,4-21,5% (2-hexenal was dominant), esters – 11,4-22,7% (ethyl oleate was dominant), monoterpenes – 5,0-6,5% (linalool was dominant), acetals – 3,1-4,0% (1,1-dietoxy pentane was dominant), sesquiterpenes – 0,1-1,8% (α-humulene was dominant), alcohols 0,5-1,0% (1-hexanol was dominant), ketones – 0,1-0,8% (2-nonanone was dominant) and lactones – 0,1-0,9% (γ-dodecalactone was dominant).

• Geists produced from 3 raspberry varieties (Willamette, Meeker and Tulameen) had different aromatic profiles, which affected the existence of fine differences in sensory characteristics of the Geists. All varietal Geists had a characteristic raspberry flavor. However, Geist of Willamette had an extra creamy note, Geist of Meeker had piney, terpenic character, and Geist of Tulameen was very fruity and most resembles on raspberries.

Figure 3. Content of aromatic components (%) in all 3 monovarietal Raspberry Geists : a) C13 Norisoprenoids, b) Aldehydes, c) Esters, d) Monoterpenes, e) Sesquiterpenes, f) Alcohols, g) Acetals, h) Ketones, i) Lactones

ACKNOWLEDGEMENTS

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