Comparison of European Honeys to Tropical Honeys – Effects of Yeast Cell Numbers on the Concentration of Selected Components

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Due to the climate conditions, especially tropical honeys are often affected by yeasts which may lead to negative sensory changes in the honeys. Because yeasts mostly produce glycerol and ethanol, it was postulated to limit the yeast cell number in commercial honeys to 500.000/10 g and the content of glycerol to 300 mg/kg (RUSSMANN) as well as the content of ethanol to 10 mg/kg (SCHROEDER). Therefore, we analysed the yeast cell number, the contents of glycerol and ethanol (RUSSMANN) as well as the content of ethanol to 10 mg/kg (SCHROEDER). While RUSSMANN also determined the yeast cell number in honeys, SCHROEDER focused on the content of ethanol.

Additionally, we determined different metabolism products (TIMMROTH and SPEER), e.g. the free fatty acids after methylation as their methyl esters. Furthermore, using GC/MS, we detected ethyl esters of three fatty acids in some honeys. This was not unexpected because the ethyl esters were described by WAGNER and RAPP as ingredients in wine affected by wild yeast species. The chromatogram of a rapeseed honey is presented in Figure 5.

Fig. 1 Yeast cell number / g in European and tropical honeys

Fig. 2 Ethanol content (mg / kg)

Fig. 3 Glycerine content (mg / kg)

Fig. 4 Total of free fatty acids (C₁₆:0, C₁₈:1, C₁₈:3) and their ethyl esters.

All contents are in mg / kg honey.

Fig. 5 GC/MS chromatogram of a rapeseed honey (The Czech Republik)

Conclusion:

1. Tropical honeys were significantly stronger yeast-loaded than European honeys.
2. The yeast cell number, the glycerol content and the ethanol content in tropical honeys frequently exceed the postulated limits by RUSSMANN and SCHROEDER.
3. Fatty acid ethyl esters were more often detected in tropical honeys in correlation with a higher yeast cell number and a higher ethanol content.

References


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