

Production of Diacetyl, Pentandion, Acetaldehyd, Etylacetate and Isoamylacetate with Different Yeast Concentration



Brewing Science

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Abstract

The aim of this work is to study the influence of yeast concentration in fermentation, in all its stages and the influence on forming the higher alcohols as important components of beer. The yeast concentration is important for reaching the desired fermentation parameters and the right concentration of higher alcohols as for the quality of beer in general. The attenuation degree has been risen with the rising of yeast concentration and the samples 4,5 and 6 have the higher degree of fermentation than samples 1,2 and 3 where the yeast concentration is smaller. Chemical analyses of final beer show that the highest degree of fermentation is reached at sample 5, where the apparent degree of fermentation is 84.06%. As for higher alcohols they differ in independent way from each other and while at propanol and isobutanol we have the light rising of values with the rise of yeast concentration, at isoamylalcohol occurs the opposite thing and have the small drop of values.

Introduction

The study has been done with six different concentration of yeast. We can say that the yeast concentration has had the direct impact in the time of main fermentation where with rising the concentration was shorten the time i.e. is developed the faster process of fermentation.

Material And Methods

Practical work was done in Birra Peja Brewery, in Peja, in wort production, fermentation and maturation department and the chemical analyses were done in the laboratory of the brewery.

There were used six different concentration of yeast during fermentation:

1. Concentration of 15×10^6 cells/ml (sample 1).
2. Concentration of 20×10^6 cells/ml (sample 2).
3. Concentration of 22×10^6 cells/ml (sample 3).
4. Concentration of 25×10^6 cells/ml (sample 4).
5. Concentration of 30×10^6 cells/ml (sample 5).
6. Concentration of 35×10^6 cells/ml (sample 6).

Result and Discussion

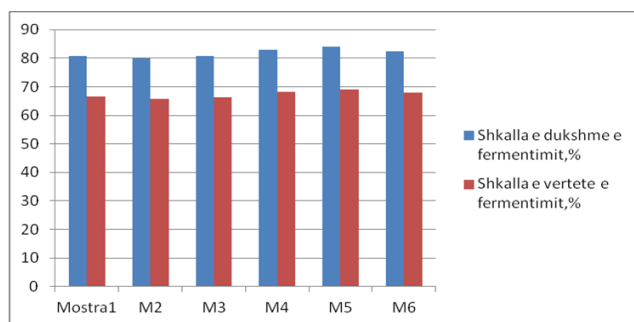


Figure 1. Apparent and real degree of attenuation in beer for six different concentration of yeast.

From the figure we can see that the apparent and real degree of attenuation rises with the higher concentration of yeast which means that the fermentation degree is bigger with higher concentration of yeast.

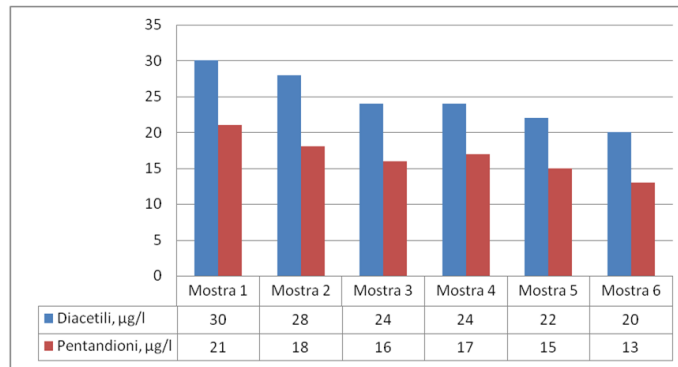


Figure 2. Diacetyl and pentandion produced in beer with different concentration of yeast.

As we can see from figure 2, the amount of diacetyl and pentandion is produced less at higher concentration of yeast. The figures differ from 30µg/l at sample 1, where the concentration of yeast is less, to 20µg/l at sample 6, where the concentration of yeast is the highest.

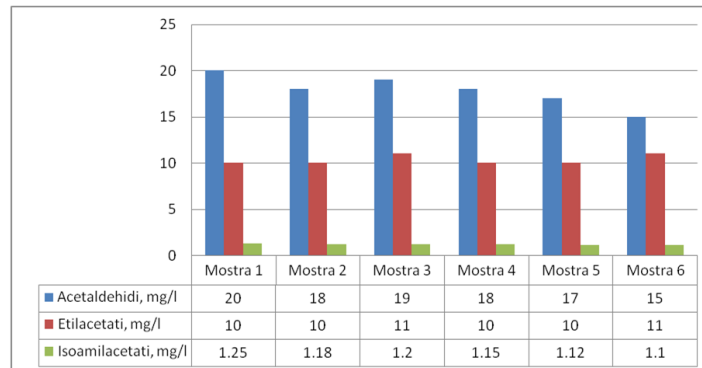


Figure 3. Comparison of Acetaldehid, Etilacetate and Isoamilacetate in beer with different yeast concentration.

At figure 3 are shown the values of acetaldehid that differ from 20 to 15 mg/l, etilacetate from 10 to 11 mg/l, and isoamilacetate that differs from 1.25 to 1.1 mg/l.

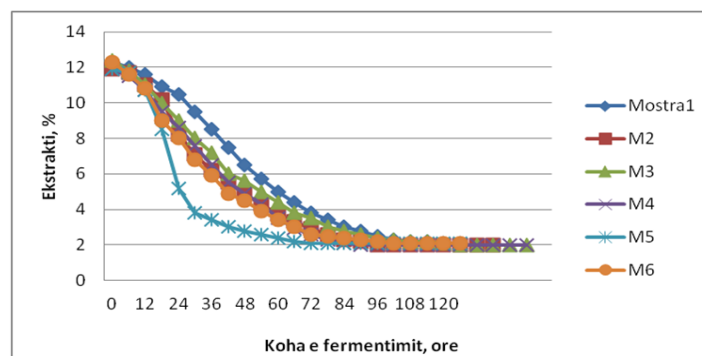


Figure 4. The profile of fermentation for six different concentration of yeast in beer

The figure 4 shows the profile of fermentation of beer for six different concentration of yeast and shows that sample 5 had the fastest concentration.

Conclusion

We can say that the yeast concentration has had the direct impact in the time of main fermentation where with rising the concentration was shorten the time i.e. is developed the faster process of fermentation. The attenuation degree has been risen with the rising of yeast concentration and the samples 4,5 and 6 have the higher degree of fermentation than samples 1,2 and 3 where the yeast concentration is smaller. Chemical analyses of final beer show that the highest degree of fermentation is reached at sample 5, where the apparent degree of fermentation is 84.06%.

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