

Common mead faults

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Abstract: Mead represents the first alcoholic beverage known by humans since ancient times. It is obtained from the alcoholic fermentation of diluted honey mixed with wine yeasts. Because honey production is an activity with significant economic importance but in the last period due to economic problems it is currently being sold at low prices it is imperative to find ways to make honey profitable. Mead represents one of the solutions of this problems.

Key words: honey, mead, honey wine, fermentation, mead faults

INTRODUCTION

Honey, the sweet substance produced by honey bees, has been used for centuries to prepare traditional, homemade drinks. Honey can be fermented to produce different types of mead (honey wine), sherry type wine, sparkling wine and fruit-honey wine, which may have different flavors depending the floral source of the honey and the additives and yeast used in fermentation (Gupta and Sharma, 2009).

Honey is a natural product, mainly composed of a complex mixture of carbohydrates and other minor substances, such as organic acids, proteins, minerals, vitamins and lipids (Finola et al., 2007). It is very well known that honey's composition varies, depending on floral origin, geographical, environmental and seasonal conditions. Because of this variables it is very hard to obtain a final product similar with an previous batch, and the fermenting process is very complex depending on the type of honey, honey-must composition and yeast strain, taking several months to complete. During the fermentation process can occurred several problems that can affect the uniformity of the final product.

MATERIAL AND METHODS

A major issue in mead fermentations is the notoriously long time it can take to reach completion. Fermentation rate is dependent to some extent of the honey variety, but through proper selection of yeast strains, agitation during

fermentation, yeast nutrition and control of pH, one can dramatically increase the fermentation rate (McConnell and Schramm).

The fermentation process of mead is very similar with fermentation process of grape wine. Honey must represents a fascinating environment totally unexplored, its fermentation being different by grape must fermentation. We can characterize honey must as being a difficult medium for fermentation due to its sugar content which is approximately three times higher than the grape must. The biochemical composition varies from one to another type of honey being directly influenced by changes in environmental factors – is difficult to obtain from a batch to another a finished product that meets the same biochemical and sensory characteristics. Because of this variables a lengthy and rigorous study is required to examine the depth and aspects that affect the production of mead, researching the raw material and the affecting factors ending with the production process and how it can be optimized.

RESULTS AND DISCUSSION

During the fermentation process can appear different problems that can affect the final product. It is important to understand the causes of the problem and how it might be fixed. Most faults can have several possible causes so is imperative to understand and study the ingredients and the fermentation process.

The acetic taste is one of most common faults, manifesting with volatile acidity in winemaking. It is perceived as a sharp sourness or vinegary flavor. It is caused by the presence of oxygen and acetobacter infection. To prevent acetic fault it is necessary to check the process and ingredients for sources of infection. Also check sanitation of all ingredients added before and post-fermentation.

The acidic taste (low pH) it is perceived as a sours taste sensation. There are several causes as: addition of acid, acid level in honey or infection. Control actions require check level of acid addition and the acid levels in honey.

When chemicals in the mead come above taste we have a chemical fault. It is perceived as chemical, vitamin, nutrient flavors, and it is caused by an excessive use of nutrients or contaminated water.

The cloudy aspect, obscured with visible particles. The product has an hazy appearance, or floating flakes. It is caused by different reasons: yeast remaining in suspension, clarifiers not working, unfermented honey, or pectin haze. In this case allow sufficient time for clarifying agents to work properly, add pectinase or mechanically filter. Also try different clarifying agents.

The moldy taste is caused by oxidation or mold growth. Stale water and ingredients or storage in musty barrels or containers can cause moldy taste. It is necessary to use fresh ingredients and check sanitation.

The metallic taste, perceived especially like flavor of iron it can be caused by excessive additives addition, corroded equipment or uncleaned equipment. Also contaminated water supply can represent a cause of this fault. The controls that shall be imposed are check of water for metallic ions; reducing water salts if it is necessary; check equipment condition for rust; reduce nutrient addition. Also, try using reverse osmosis water and add salts as needed (BJCP Mead Exam Study Guide, 2014).

If the taste it is perceived corresponds to the following sensations: hot, spicy, warming or burning mouth feel and aftertaste we are facing with the alcoholic fault. It was possible that during the fermentation process the temperature to be too high, are the fermentation was unhealthy. The controls are:

- a lower fermentation temperature
- let mead age longer before consuming
- use less fermentables
- use a less attenuative yeast strain
- check yeast health
- use sufficient yeast nutrients
- check for possible infection, which could have caused more attenuation
- stabilize mead to prevent further fermentation

The phenolic fault is perceived as spicy, smoky, plastic, band-aid, medicinal, clove, or vanilla aroma and flavor (BJCP Mead Exam Study Guide, 2014). The main causes is infection with wild yeast. Also, some types of honey can have naturally this flavor so it's important to conduct an organoleptic analysis of the honey and check yeast strain and health.

The sulfury smell is generally unpleasant. It is perceived as rotten eggs or other sulfur-based aromas and flavors. It is caused by yeast most of the times. Insufficient nutrients (especially nitrogen) can cause the yeast to expel hydrogen sulfide. To prevent this fault it is imperative to provide sufficient nitrogen-based nutrients, or to change the yeast strain.

CONCLUSIONS

In most of the mead-producing countries, alcoholic fermentation is a result of the growth of indigenous microorganisms naturally present in honeys and always surviving on the substrates and equipment used (Ashenafi, 2006;

Bahiru et al., 2001). In these cases, alcoholic fermentation is even more unpredictable and very often at the end of fermentation, mead is completely spoiled by contaminating yeasts and bacteria which makes it undrinkable.

There is a lack of scientific information about honey-must fermentations but it is accepted by mead makers that mead quality improvement includes the development of the proper additive formulation and optimization of fermentation conditions (Mendes-Ferreira et. al., 2010).

In conclusion the quality and taste of mead depends, apart from fermentation control and the quality of the various ingredients, mostly on the characteristics and taste of the selected honey. The first production phase consists of the preparation of the must. The water can influence the mead's flavor. Also, the choice of yeast and mix of different nutrients influence the final flavor, but selection is also important in order to have complete and uninterrupted fermentation.

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