THE INFLUENCE OF CULTURE MEDIUM ON THE DYNAMICS OF FERMENTATION OF WINE YEASTS

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ABSTRACT

Wine yeast strains *Saccharomyces ellipsoideus* have important applications in food industry and in this regard is sought isolation as pure cultures and selecting those strains, which in laboratory investigations which have great biotechnological properties This study was intended as the ratio of live cells and autolysates cells also the influence of culture medium on this report. Yeasts selected for this study were isolated from industrial strains of indigenous grape varieties, namely: Feteasca Royal (FR) Feteasca White (FA), black Feteasca (FN), Romanian Tamaioasa (TR), Babeasca Black (BN) and Cotnari Grasa (GC).

KEYWORD

Wine - yeast - *Saccharomyces ellipsoideus* – biotechnological - properties

INTRODUCTION

Yeasts genus *Saccharomyces* have been studied extensively, and some of their properties for industrial use recommend, alcoholic fermentation is directly influenced by physical, chemical and biological factors (Banu, 2009).

MATERIALS AND METHODS

The wine yeast strains isolated from native grape: Feteasca Royal (FR), white Feteasca (FMD), Black Feteasca (FN), Romanian Tamaioasa (TR), Babeasca Black (BN) and Cotnari Grasa (GC).

Thoma counting chamber

- Malt wort culture medium used agarizat enroll in range caused by company

Scharlau Chemie SA, Spain and contains malt extract 15 g / l, peptone 1 g / l maltose 12.5 g / l dextrin 2 5 g / l maltose 12.5 g / l dextrin 2.5 g / l dipotassium phosphate 1 g / l ammonium chloride 1 g / l, agar 30 / l, pH 4.8.

Synthetic medium with following composition: pH 4.8

- potassium phosphate (KH2PO4) 5.5 g / l
- ammonium sulphate (NH4) 2SO4 2.5 g / l
- magnesium sulphate (MgSO4) x7H2O 0.25 g / l
- extract yeast 1.5 g / l
- glucose 15 g / l, agar 30g / l

Of the microbial sample has intention to practice first in terms of product quality control microorganisms present, and secondly to assess the level of activity of microbial populations necessary biotechnological studies (Tita, 2001).

This determination is made by microscopic techniques and aims to determine the number total microorganisms, both living and dead. To this end it uses special blades called counting room counting microorganisms namely Thoma chamber, Bürker-Türk Goreaeva etc.

Yeast strains listed above were analyzed using a network camera that Thoma side of 1 mm and area of 0.0025 mm^2. Dilute sample analyzed after decimal dilutions technique, taking into 1 ml of final working dilution respectively the fifth dilution. Both blade and slide must be clean and degreased samples for analysis must be well mixed prior to preparation for counting, so the result as accurately express reality (Banu, 2000).

From each sample are prepared so that final result four is the average of four determinations. To examine the counting at least 10 large squares (fields), cells located in half or more than half the field being examined counted.

Counting formula is:

$N = n \times 4000 \times 1000 \times k$

N - number of cells in one ml of sample

n - average number of cells per microcells

k - dilution factor

4000 - Volume microcells in mm^3

1000 - conversion factor in ml (cm^3)

For evidence in the living yeast using the method of staining the preparation with methylene blue solution 0.1%. With this method the dead cells stained will be blue and the living will remain very poorly colored or tinted. The ratio of live and dead cells is an indicator of quality yeast culture: quality is good if the percentage is less than 5% . Of yeast culture are 5 decimal dilutions. The last dilution to 5 ml suspension of cells harvested previously homogenized by bubbling air and mixed with 5 ml 0.1% methylene blue. With chamber for Thoma is counting live cells (colored) and separately for autolysates cells (dead) in blue (Oprean, 2010).

RESULTS AND DISCUSSION

Physical Properties of cells were determined by the rate of diffusion of nutrients within the cell, establishing their shape and size. It was found that yeast cells FR, BN, GC, diameter about 8 mm. Due to very large surface cells had high productivity. Yeast cells of strains FA, FN, TR developed under the same conditions of temperature, environment and time, but cells examined microscopically sizes were slightly smaller. Depending on growing conditions and MMA medium synthetic cells had widely different sizes varying in accordance with 1-3 images.

Yeast *Saccharomyces cerevisiae var. ellipsoideus* noted FR BN, GC sown on MMA medium showed colonies with diameters ranging from 2-4 mm, curved profile having a smooth, glossy, gray white. Viewed under a microscope the cells were arranged in single or in pairs and had sizes 4 to 10 mm. Sown on synthetic medium showed smaller cells compared with those sown in the MMA.

Yeast *Saccharomyces cerevisiae var. ellipsoideus* noted FA, FN, TR formed colonies with sizes between 2 and 5 mm round shape, smooth, shiny, white-gray. Viewed under a microscope, cells were oval or oval-oblong shape, being arranged in pairs, chains or even unique, with sizes ranging from 3 to 13 mm. After counting chamber Thoma made using living cells and the ratio of dead has not exceeded 5%.

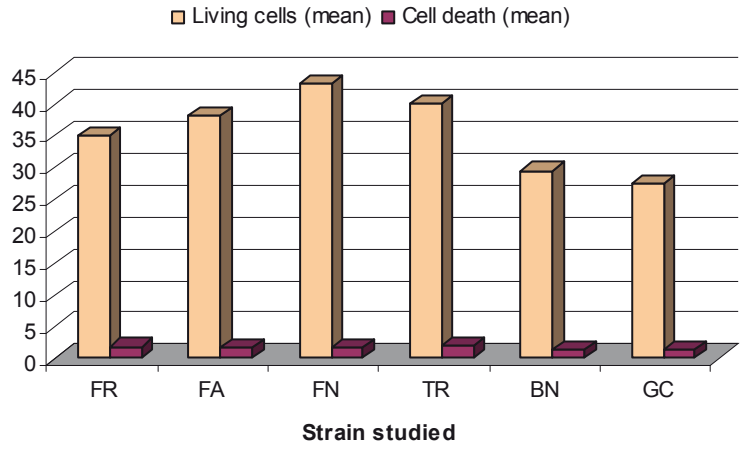

Fig.1 Number of live and dead cells present in culture microbial strains denoted FR, BN, GC, FA, FN, TR sown in culture medium MMA

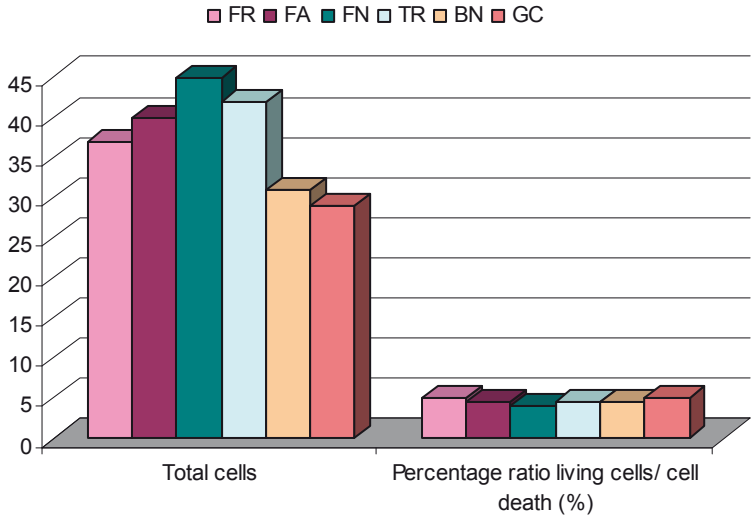

Fig.2. Percentage ratio living cells/ cell death (%)

Note that in Figures 1-2 NF strain shows the greatest number of living cells to count, and the more modest values are found to stem GC.Strains TR and FA have similar values, decreasing slightly in viral FA and BN. Number of cell death is lowest for the FN strain and the highest for BN strains and GC.

. If insemination made in synthetic culture medium is to establish a positive trend in the number of living cells in relation to the death count is by conducting the same conditions as in the case of the seeded medium MMA. From Figures 3-4 show the most popular strains are FN followed by FA and lowest values recorded in the case of GC and BN strains.

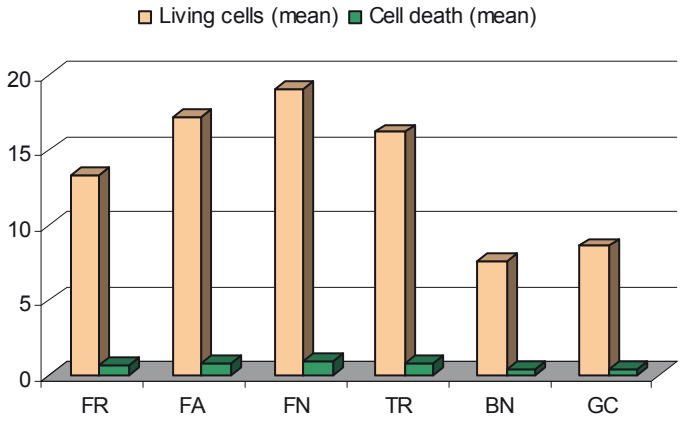

Fig. 3. Number of live and dead cells present in culture microbial strains denoted FR, BN, GC, FA, FN, TR sown in synthetic culture medium

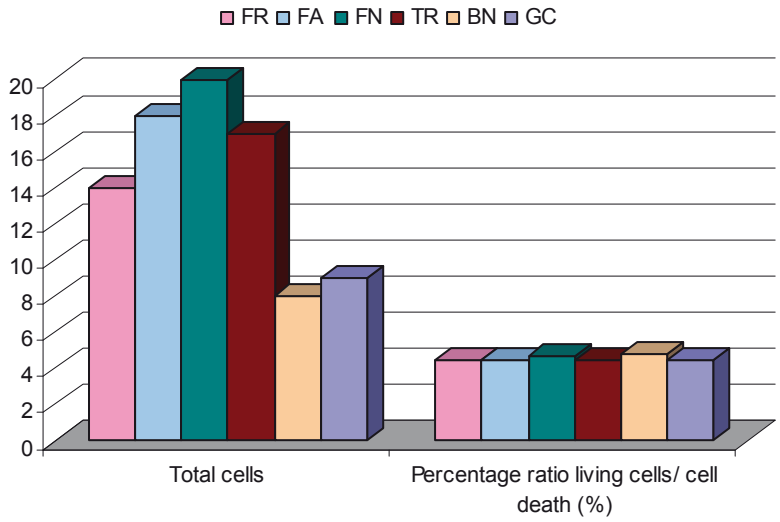

Fig.4. Percentage ratio living cells/cell death (%)

Making an analysis of the values obtained for the two strains seeded culture medium we notice that the most favorable medium for maintaining living cells at the same time is developing synthetic medium that provides the nutrients necessary.

CONCLUSIONS

The medium is a decisive factor in the evolution of wine yeasts and the laboratory synthetic medium can meet performance criteria beyond standard biotechnology. Development criteria are conditioned of wine yeast nutritional factors and medium conditions provided . Characters of biotech selected wine yeast strains is a decisive factor for their use in processes fermentation. Autolyzed of yeast is important because it is an indicator of their viability and result in selecting those strains with higher technological and biological characters. When studied in this work yeast with the properties mentioned above was higher that isolated from grapes and marked with black Feteasca (FN).

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