



**Thesis title:**  
**Microbiological and chemical characterization of Picolit wine**

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**Confidential:**  Yes  No

**Abstract (max 300 words)**

**Topic position & objectives:** In this study microbial biodiversity and dynamics were investigated during the vinification of sweet wine obtained from withered and noble rot affected grapes of Picolit variety. Furthermore, it was evaluated possible contamination and interference during alcoholic fermentation by the yeasts present at the winery surfaces. Chemical analysis of must and wine during vinification was performed in order to evaluate the influence of microbial population on the quality of the wine.

**Methods:** Grape musts and wines during fermentation were analyzed by culture-dependent (plating on culture medium) and culture-independent methods (direct DNA sample extraction). Contact plates with culture media were used to evaluate the biodiversity of winery resident flora. Main must and wine components (sugars, organic acids and glycerol) were analyzed by HPLC method. Alcoholic strength was measured by the AlcoLyzer Plus instrument.

**Results:** Presence of non-*Saccharomyces* species (*Metschnikowia pulcherrima*, *Hansenula uvarum* and *Pichia membranifaciens*) was observed only at the initial stages of vinification. Alcoholic fermentation was completely performed by the yeast strain selected as a starter culture and produced wine had 14.1% of alcohol and 139 g/L of residual sugar. Yeast isolated from winery surfaces were not found in must and wine samples. Lactic acid bacteria showed great diversity during the course of vinification.

**Main conclusions:** Similar results were obtained by both culture-dependent and –independent molecular microbiological analysis, highlighting the microbial biodiversity during the production of Picolit sweet wine. *Saccharomyces* yeast strain used as a starter culture displayed appreciable capability to overcome osmotic stress and to yield ethanol fermenting must at high sugar concentration. It showed the ability to suppress the indigenous non-*Saccharomyces* yeasts. No influence of the winery resident flora was found on the course of vinification and consecutively on the quality of produced wine.

**Keywords (5):** microbial population, high sugar grape must, culture-dependent and –independent molecular methods, winery resident flora, principal component analysis