# OENOLOGICAL INCIDENCE ON TANGENTIAL MICROFILTRATION IMPROVE THE QUALITY OF VINE FROM FETEASCA REGALA CULTIVAR

## INCIDENȚA OENOLOGICĂ A MICROFILTRĂRII TANGENȚIALE ASUPRA CALITĂȚII VINURILOR OBȚINUTE DIN SOIUL FETEASCĂ REGALĂ

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**Abstract.** *This research was realized in the framework of the National Research Institute for Horticulture Biotechnologies, Stefanesti Arges, Romania.*

*The quality of wine is very important for the customers. By this study I tried to improve the quality of wine using the tangential micro filtration. Micro filtration is a good method to have a good quality of wine. For clarify and stabilization of wine micro filtration is a good way in this sense.*

**Rezumat.** *Cercetarile s-au realizat in colaborare cu Institutul National de Cercetare pentru Biotehnologii Horticole, Stefanesti Arges, Romania. Calitatea vinului este un aspect foarte important pentru consumatori. Prin acest studiu am incercat sa imbunatatim calitatea vinului folosind microfiltrarea tangentiala. Microfiltrarea este o metoda de clarificare si stabilizare a vinului.*

Elaboration and implementation of this research tracks follow scientific reasons and problems in oenology: increase of the consumer's exigency about wine quality on the intern and extern market; necessity alignment of Romanian wines and oenology technology to international standards; necessity reducing of oenology time and cost.

## MATERIAL AND METHODS

The aim of our studies is effect of microfiltration and ultrafiltration on physic-chemic structure of wine in laboratory and production conditions, the impact of these methods on elaboration, conditioning and stabilization of the wine.

In tangential microfiltration technique are used NITOR 120 PADOVAN filter, with automat system PLC Siemens S5 95U. Filter are equipped with 12 modules mounted vertically and parallel, couples facultative. The modules are made from tubular fascicles with symmetric propylene membrane with cut-off 0,2 mm. The filter is equipped also with automat washing system of membrane in time of filtration (back-wash).

Technical data:

- filtration debit (l/h): 5000-6000
- maxim temperature: $40^0$C
- maxim transmembranare pressure: 1,5 bar
- mean duration of filtration cicle: 10-20 h

Filtration product can not contain bentonite or other foreign compounds.
The duration of functionality of alimentation pump: 3-5 min.

Functionality parameters:
$P_I$ = 2,0 bar;
$P_E$ = 0,95 bar;
$P_{TM}$ = 0,90 bar;
T = 17 – 18°C ;
Back – wash = 5/240 seconds.

Experimental variants: Feteasca Regala brut wine, Feteasca Regala must obtained without pressing the grapes, Feteasca Regala press wine, Feteasca Regala must obtained without pressing the grapes + Feteasca Regala press wine.

## RESULTS AND DISCUSSIONS

Regarding oenological incidence on physic-chemic structure of Feteasca Regala brut wine and on polysaccharide, gums, polyphenols and proteins we study the impact of alluvial filtration and of tangential microfiltration on these. We calculated the value of main macromolecular compounds obtained in witness variant.

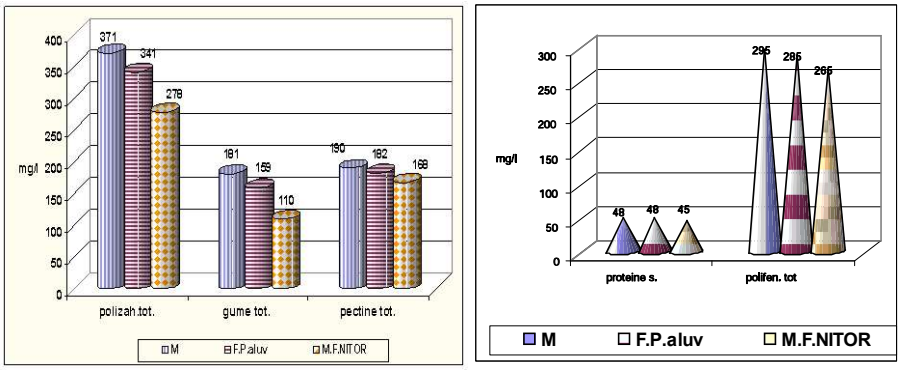


**Fig. 1**. The influence on Feteasca Regala brut wine
*M-* Witness*; FP aluv.– alluvial filtrate wine ; MF – Tangential microfiltration wine*

Feteasca Regala brut wine clarification process by alluvial filtrate and by tangential microfiltration (NITOR) shows significant differences between these two techniques (figure 1). By compare the two filtrating methods, we observed that the results are favourable for tangential microfiltration. So, total phenolic compounds registered decreasing between 10 and 12%, comparative 3-4% for alluvial filtration. The most significant effect of microfiltration is for compounds with great molecule, the main responsible for wine clearly. In rapport with alluvial filtration, we obtain a decreasing of total and fractional polysaccharides (38-40%).

Alluvial filtration determined a minor reduced of protein quantity, compare microfiltration.

For alluvial filtrate wine clogging are after 245 ml, and for wine with microfiltration are possible filtration through membrane with 1 μm diameter (table 1).

**Table 1.**

**Clogging indicator**

| | Witness wine | F. P. alluvial wine | Permeate MF-NITOR wine |
|---|---|---|---|
| Clogging indicator | Clogged to 20 ml | Clogged to 245 ml | 14,6 |

The influence of tangential microfiltration for must obtained without pressing the grapes and press wine was made with laboratory filter equipped with 0,1 $m^2$ MICROSART modules, with asymmetric polysulfone membrane with cut-off 0,2 μm or poliolefinic membrane with cut-off de 0,1 μm. For wine resulted by filtrating remain constant: alcohol, total acidity and $SO_2$. Important modifying are for: polysaccharides, polyphenols, proteins (figure 2), and for turbidity, clogging indicator and microbiologic loading.

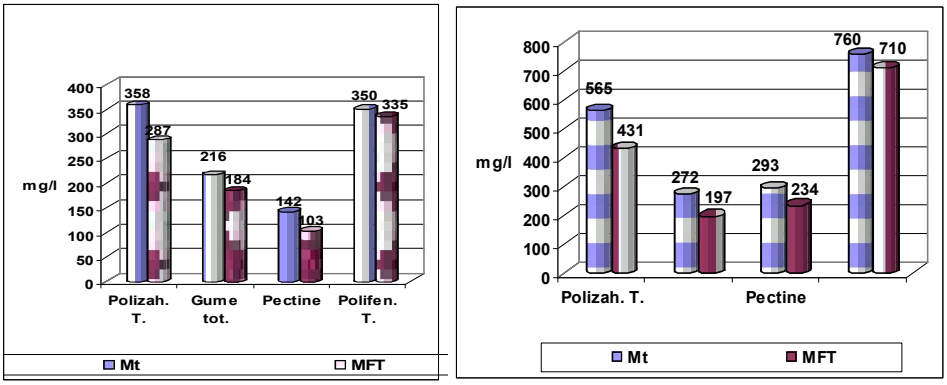


**Fig. 2**. The influence of tangential microfiltration on must obtained without pressing the grapes Feteasca Regala (left) and on press wine Feteasca Regala (right)
*M- Witness; MFT – Tangential microfiltration wine*

Wine obtained by tangential microfiltration present small values of turbidity, a reduced of active germs (table 2).

**Table 2.**

**Sterilized effect of micro filtration**

| Characteristics | Witness | Tangential microfiltration |
|---|---|---|
| Must obtained without pressing the grapes | | |
| Clogging indicator | 11 ml. in 37 s | ICM=10,5 |
| Turbidity NTU | 256 | 2 |
| Number of active germs / ml. | 1,85x $10^6$ | 0,53 |
| Press wine | | |
| Clogging indicator | 9,5 ml. in 37 s | 320 ml. in 300 s |
| Turbidity NTU | 395 | 43 |

## CONCLUSIONS

For clarification and stabilization of neconditionate wines, tangential microfiltration represent superior method comparative classic treatments.

The smaller value of clogging indicator for resulted wines permit the utilization of membrane with 1 μm diameter pores to follow filtrations.

This technique creates the premise to obtain wine with normal physic-chemic structure, comparative classic witness, but with a higher value of filterability and turbidity, and with eliminating of great number of dregs from wine.

Tangential microfiltration permit obtain by only one passage through membrane a stabile and clear products.

Wines obtained by microfiltration present good stability and clearly and after 90 and 120 days from filtrating.

## REFERENCES


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