

USE OF A YEAST PROTEIN EXTRACT IN A CLARIFICATION TESTS FOR WHITE MUSTS AND FOR A BOURGOGNE RED WINE

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Under a regulation more and more limited for the enological adjuvant; wine enrichment with compound already naturally present (endogen adjuvant) is a more and more prospected path. One example is the use of yeast derivate products as flavor and stabilization agent.

Their properties are the one of mannoproteins and, in a lower extent also of peptides. Recently, we have tested some intracellular yeast protein as clarification agent (Charpentier et al, 2006)

It is possible to obtain yeast extract by autolysis more or less rich in protein by changing the medium parameters (temperature, pH) and by using yeast strains with high proteolytic characteristic. The extracts obtained are concentrated and dried. They contained between 60 to 65% of protein.

Table 1 shows the composition of protein extract from yeast used for the clarification trials of white musts and of a red wine. Such extract contains protein fractions of molecular weigh between 76 and 31 kDa. They are comparable to the one found among the traditional clarification agents as those from animal origin such as eggs albumin, casein and gelatin.

Parameter	Quantity (mg/g)
Total Nitrogen	116
Amino nitrogen	29
Proteins	85
Oses	92
Insoluble	0

Table 1 : Composition of the protein yeast extract

The grape musts of three varieties : *Riesling*, *Pinot blanc*, *Pinot gris* are clarified part with 20g/hl of a mix of PVPP(23%), casein (57%) et bentonite (20%) and part with 5g/hl of protein yeast extract.

Whatever the mode of clarification, the *Pinot gris* must remains cloudy: 15% of suspended solids versus 2-5% in the *Riesling* and *Pinot blanc* musts, but the filterability almost duplicates after the must have been clarified with the protein yeast extract (figure 1).

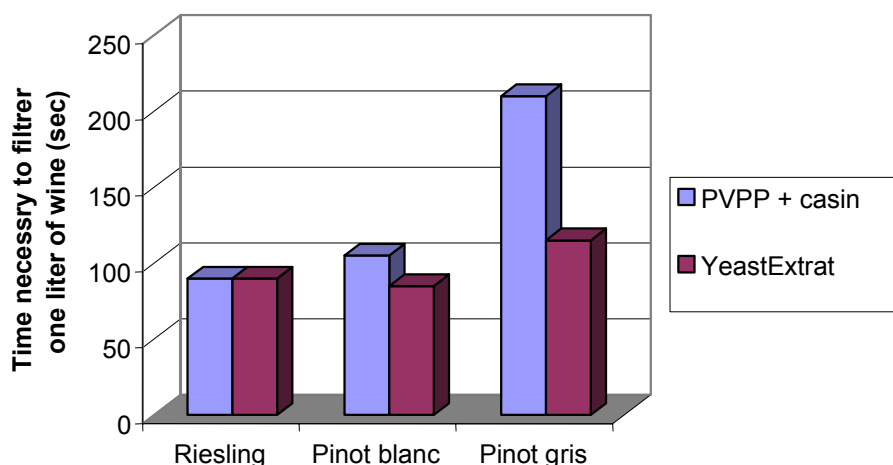


Figure 1 : Influence of the grape must clarification on the filterability of the white wine

In the clarification test of a *Pinot noir*, the effect of a gelatin powder at 8 g/hl have been compared, after 48h, to the effect of increasing doses of protein yeast extracts: 30, 45 and 65 g/hl (table 2).

Used fining agent		Gelatin	Protein yeast extract		
Concentration (g/hl)		8	30	45	60
Turbidity (NTU)	28	15	3	4	8
IC' (A420 + A520+ A620)	0,99	1,09	1,10	1,08	1,06
Color Taint (A420/ A520)	0,89	0,64	0,65	0,65	0,64
Total Polyphenol Index (IPT)	65	64	62	62	63
Ethanol index	17	30	34	36	46

Table 2: Comparison of the influence of clarification with gelatin (8 g/hl) and with protein yeast extract (30, 45, 60g/hl) on the turbidity and on the phenolic composition of the red wine *Pinot noir*.

The decrease of turbidity is more important with the protein yeast extract than with the gelatin notably with the concentration of 30 and 45 g/hl. At 65 g/hl a light overfining effect is observed. Whatever the gelatin and the concentration, the color intensity (IC) does not change. In opposite, the color is highly revived: the taint decrease of about 72% after clarification with gelatin as well as with the concentration used of protein yeast extract. The total phenolic index (IPT) is lightly lowered, notably with the protein yeast extract at 30 g/hl (around 4.5%).

The ethanol index, which corresponds to the combination rate of tannins and polysaccharides, strongly increases after clarification: from 76% for clarification with gelatin to 135% for clarification with protein yeast extract at 60 g/hl.. Presumably there is an enrichment of the wine in polysaccharides from the yeast extract which enclose sugars.

From the sensory prospective, the white wine originated from musts clarified with protein yeast extract are described as having more body, with more persistent flavor, and with no effect on fruitiness. The red wine clarified with the same protein yeast extract are better rated for the quality of their tannin, which are sensed as more supple, more smooth, and less aggressive.

Following these first trials, new yeast strains are currently tested for protein production. They are characterized by molecular sieving and by electrophoresis in view to specify their role and their interest in the clarification of musts and wines.

Charpentier C., Caillet M.M., Feuillat M. (2006) Essais de collage de moûts blancs et de vins rouges avec un extrait protéique levurien : comparaison avec les colles traditionnelles. *Revue des Œnologues*, 120, pp 47-50.