Effect of nano-composites on the *Saccaromyces cerevisiae* living as yeasts of bottom fermentation

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Science-based use of nano-particles opens up new possibilities in many areas of human activity: from the creation of super-computers, super-strong materials to the development of highly efficient antibacterial agents and others. However, on the other hand, the hasty introductions of nano-particles in everyday human activity undoubtedly pose a risk to health. Because scientific research should also be aimed at studying the impact of nano-materials on biological objects at different levels of living, particularly at the sub cellular, cellular, organ and whole organism levels. Some nano-particles, depending on their composition and size, can penetrate though biological membranes inside the cell and cause irreversible damage by oxidative stress and violation of organelles. It was examined the direct effect of such nano-composites as Saponite-H+; Nb-Sap-Cl and Nb-Sap-EtO in the solid state on the growth and viability as well as mitochondrial and reductase activity of *Saccharomyces cerevisiae* yeasts which are simultaneous single cell and eukaryotic organism. It was revealed that the above mentioned nano-composites and, especially Nb-Sap-EtO, at the concentration of 2 mg/mL caused increasing number of cells (up to 5 times). This can be explained by high oxidizing properties of the saponite nano-composites in result of the process of decomposition of the complex elements to the simple ones. The adsorption and assimilation of nutrients in yeasts are accelerated since these processes become less energy intensive, faster and more effective. Simultaneous, Sap H+ and Nb-Sap-Eto at the concentration of 0.5 mg/mL had the higher values (almost 4 times) of the number of mitochondrial indexes in the comparison with the control level. But at the increasing the concentration of these nano-composites effect was slightly smaller and still higher than in control. This is due to the high oxidizing properties of these substances that stimulate mitochondrial reductases in the yeast cells. It was concluded that the investigated nano-composites are biologically compatible and may be used without any dangerous.