

## THE TOXIC SUBSTANCES FORMED IN THE PROCESS OF MICROBIAL SPOILAGE OF THE WINE AND THEIR EFFECT ON THE HUMAN BODY

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The main goal of every wine producer is to create a high-quality and safe product, which means the absence of toxic, carcinogenic, mutagenic or any other adverse effect on the human body. Taking into account the modern changes in ecology, weather and climatic conditions, the technogenic impact of humans on the environment, the prospect of abnormal changes in biotopes is going towards an undesirable direction. This is especially true for viticulture. The damage to soils and grapes by pests, bacteria, fungal diseases, in particular, various kinds of mold, yeast, etc., has significantly increased.

Fungi, such as a mold, can spoil grapes and wine by contaminating them with secondary toxic metabolites named mycotoxins. Several mycotoxins have been found in wines, such as ochratoxin A (OTA) produced by various *Aspergillus* and *Penicillium* species, metabolites of *Tricothecium roseum* and *alternariol* [1]. In modern winemaking, the problem of mycotoxins has become especially relevant, because molds have come to be considered not just pests that violate the quality of finished products, but also sources of toxic substances for the consumer [3]. To clarify this topic, relevant literary sources of recent years, including medical ones, were analyzed using the following databases: PubMed, EMBASE, HINARI, Virtual Health Library (LILACS & SciELO) and Science Direct Publisher Site, Europe PMC Free Articles, Cross Ref., where numerous studies on the effect of mycotoxins and phenols on the human body are described. When ingested in small doses, they do not cause symptoms of poisoning. The action of these toxins is slow, they tend to accumulate. Due to long-term, regular intake in the human body, many of these toxins initiate the development of various pathological conditions and chronic diseases. Among them are skin diseases, diseases of the respiratory system, nervous system, hepatic and renal failure. Thus, it is assumed that one of the causes of Balkan renal nephropathy (a peculiar form of renal failure) is chronic poisoning with ochratoxin A [6]. Also, the International Agency for Research on Cancer has named ochratoxin A a possible human carcinogen. Embryotoxicity and teratogenicity of ochratoxins have been proved [7]. Cytotoxicity has been demonstrated in vitro on the model of human neutrophils [5]. As a result of oxidative damage to DNA by ochratoxins at low, non-cytotoxic concentrations, an oncological transformation of cells is initiated, leading to nephrocarcinogenesis [4].

Another cause of serious problems in winemaking is yeast, especially a prominent representative - *Dekkera* / *Brettanomyces bruxellensis*, that produces volatile phenols, 4-ethylphenol (4-EP), which leads to phenolic pollution of wine, the appearance of the smell of "horse sweat", "barnyard", etc [2]. With the regular intake of these substances into the body, not only ingested, but also when inhaled, even in small doses, nonspecific signs of chronic poisoning appear: chronic fatigue syndrome (weakness, sweating, irritability, increased fatigue, poor sleep, headaches, dizziness), dyspeptic symptoms, functional disorders of the central nervous system,

secretory-motor activity of the stomach, initial symptoms of chronic toxic hepatitis, dermatitis, allergies, etc.

The problem is that physical or chemical treatment cannot break down the toxic substances that form in the finished product. Therefore, in order to prevent spoiled wine from reaching the consumer, it is important to determine the presence of microorganisms that cause spoilage in the early stages of production process. This can be achieved by using modern molecular genetic diagnostic methods such as real-time PCR.

Conclusion: Toxic products and their metabolites, formed in wines as a result of microbial spoilage, pose a serious danger not only to the wine quality, but also to public health. Timely, adequate and rapid diagnostic of wines helps to preserve their quality and safety.

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