

## New Wine Yeasts: On the Publication of the Book *Sovremennyye preparativnyye formy drozhzhei dlya vinodeliya* (Modern Preparative Forms of Yeasts for Wine-Making) by N.N. Martynenko, Moscow: Rossel'khozizdat, 2006<sup>1</sup>

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N.N. Martynenko's monograph is virtually the first book published in Russia, which promotes the use of the preparative forms of yeasts for highly technological wine-making. Earlier, only books on the microbiology of spontaneous wine fermentation appeared [1–4].

N.N. Martynenko's book is an exhaustive review of the scientific and applied literature available to date, as well as the patents pertinent to the theme in question. The total number of sources is over 400. The handbook is well illustrated with numerous descriptive drawings, photographs, and tables. The book is not simply a compilation of the literature data, the author interpreted the data based on many years of his successful experience in the field. The fact that the author has prepared his doctoral dissertation pertinent to this theme is noteworthy. The book reviewed consists of two parts.

Part 1. "Dry active yeasts." Dry starter yeasts produced by the world's leading manufacturers are described and characterized. The physiology, chemical composition, and metabolism of wine yeasts are considered in detail. Much attention is given to all stages of the technology of production of highly active dry wine yeasts, from the initial cultures and the raw materials used to yeast cultivation and drying. The high-quality description of the most important modern yeast preparations and of the scientific basis of their rational application should be noted. A special section is devoted to the problems of the use of dry wine yeasts in the Russian Federation and the CIS countries; this concerns the production of grape, sparkling, and fruit–berry wines.

Part 2. "Immobilized wine yeasts." Achievements of national biotechnology in this field are universally recognized. The author discusses in detail the application and the specifics of immobilized yeasts in various wine-making plants. Different methods of immobilization of wine yeast are considered: cell adsorption on carriers, incorporation into gels, covalent yeast binding, and the use of membrane technologies. Attention is given to the specific features of the physiology and biochemistry of immobilized yeasts. The general aspects

of the application of immobilized yeasts are considered, not only for producing sparkling and grape wines, but also for removal of harmful substances, lowering the wine acidity, and prevention of insufficient fermentation. The book also considers the use of preparative forms of yeasts for fruit–berry wine-making.

We would like to draw the readers' attention to the species identity of the starting wine yeasts. Wine-making traditionally uses the yeast *Saccharomyces cerevisiae*, which has several dozens of synonyms, including *S. vini* and *S. ellipsoideus*. The numerous yeast preparations cited in the book have the species name *S. bayanus* (syn. *S. uvarum*). This is a cold-resistant yeast species with characteristic biochemical properties, in particular, accumulation of large amounts of glycerol in the wine. Soviet scientists have the priority of discovering this yeast for wine-making [5–7]. The genetic and molecular analysis data give evidence of *S. bayanus* and *S. cerevisiae* being related to different biological species. Although crossbreeding of these species is possible, their diploid hybrids are sterile; they form dead meiotic products (ascospores). The molecular data give evidence of the fact that the degree of divergence between the *S. cerevisiae* and *S. bayanus* genomes is comparable to that of humans and mice [8]. The wine strains of *S. bayanus* were isolated in different European countries: Russia, Moldavia, Slovakia, Hungary, France, Italy, Spain and Austria. These yeasts occur in a quite a cool climate or at the end of the wine-making season; they are often associated with the production of sweet grape wines, such as Muscadet, Jurancon, Amaronne, Tokay, as well as sparkling wines and cider [9–13]. Recently, the vigorously developing genomics of wine yeasts has demonstrated the interspecies hybrid nature of a number of strains. Thus, among the wine strains, including commercial ones, the natural hybrids *S. cerevisiae* × *S. bayanus*, *S. cerevisiae* × *S. kudriavzevii*, and even more complex hybrids *S. cerevisiae* × *S. bayanus* × *S. kudriavzevii* were revealed [14–19]. Wide prospects are therefore open for yeast selection based on the new species of the genus *Saccharomyces* and interspecies hybridization.

<sup>1</sup> The book was really published in 2008

A certain drawback of the book reviewed is the absence of information on dry sherry yeasts. Sherry wines are produced in Russia and CIS countries, albeit on a small scale. N.N. Martynenko's book is, undoubtedly, very useful to microbiologists, biochemists, and technologists working in the wine-making industry and other fields where preparative forms of yeasts are used. The book is also necessary for the students and post-graduates of the relevant specialties.

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