

## Oaks, grapevines and the elusive ecology of *Saccharomyces*

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Used by mankind since the dawn of civilization to make alcoholic beverages or to raise bread, *Saccharomyces* yeasts, especially *S. cerevisiae*, are amongst the best represented microbes in culture collections. The availability of strains and their tractability in the laboratory promoted decades of intense research, which in turn granted to *S. cerevisiae* the role of model organism in cellular biology, molecular genetics or genomics. Paradoxically, in spite of its stellar importance, basic aspects of the natural ecology of *Saccharomyces* remain a mystery. Starting with the experiments of Louis Pasteur, I shall review the main ecological perspectives that have fuelled the longstanding debate on the *Saccharomyces* natural habitats. A second theme will be the wild or domesticated nature of *Saccharomyces* and I will highlight recent developments. A new paradigm for *Saccharomyces* ecological studies will also be discussed. Using more sensitive isolation procedures, certain oak trees were recognized as the most reliable source of *Saccharomyces* (including *S. cerevisiae*) in natural environments. Indeed the success rate of *Saccharomyces* isolations from oaks surpassed by far that of the grape/vineyard system, thus suggesting that a truly natural ecology of mankind's favorite yeast is in place and awaits to be uncovered. As a consequence, sympatry was detected for some species, biogeographic patterns have emerged, as well as hypothesis concerning ecological speciation. In a journey to different regions of the world, we will encounter various examples of an emerging ecological scenario in which that *Saccharomyces* species have evolved.