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ISSY32<sup>nd</sup>

# Book of Abstracts

32<sup>nd</sup> INTERNATIONAL  
SPECIALIZED SYMPOSIUM  
ON YEASTS

YEAST BIODIVERSITY  
AND BIOTECHNOLOGY  
IN THE TWENTY-FIRST  
CENTURY

**SEPTEMBER 13-17, 2015**

HOTEL GIÒ - PERUGIA CONGRESS CENTRE,  
PERUGIA, ITALY  
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A grayscale microscopic image of several yeast cells, likely *Saccharomyces cerevisiae*, showing their characteristic oval shape and budding structures. The cells are arranged in a cluster, with some showing clear bud scars on their surface.

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***BOOK OF ABSTRACTS***

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## Social wasps are mating nests for yeasts

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*Saccharomyces cerevisiae* (Sce) is largely used as a model for a wealth of purposes. The recent availability of genome sequences of a large number of *S. cerevisiae* and *S. paradoxus* (Spa) strains representing the widest known genetic, phenotypic and geographical diversity renewed the interest in the use of these yeasts as models for evolution and ecology studies. Nevertheless, one of the still unanswered questions is whether genetically diverse yeasts mate and recombine in the wild. The yeasts outcrossing was estimated to occur only once every  $10^5$  mitotic division, thus confining their reproduction to mitosis and to occasional intra-ascus breeding (inbreeding). Although, the recent observation on larger set of strains of unexpectedly high levels of genetic heterozygosity and prions diffusion called the rarity of outcrossing into question. To outbreed at least two conditions have to occur: *i*) different strains has to simultaneously inhabit the same area, *ii*) they have to face environmental oscillations favouring sporulation (because natural yeasts are usually diploid) followed by germination. Social wasps have been shown to bear yeast cells all year long and feeding on sources that are potentially inhabited by different *Saccharomyces* spp. strains, thus representing a potential incubator for different yeast cells to meet and mate. Here we show that the intestine of social wasps favours the mating of different yeast strains and species by providing a sequentiality of environmental conditions prompting the sporulation and germination of *S. cerevisiae* and making heterospecific mating the only option for *S. paradoxus* to survive. Our results open a new perspective introducing insects as unaware players in the evolution of *Saccharomyces* spp. yeasts. *Saccharomyces* spp. yeasts could prefer sexual reproduction to react to the environment changes occurring within the wasp intestine and in the continuous flux from the wasp to the environment and vice-versa.

**KEYWORDS :** *Saccharomyces cerevisiae*, *Saccharomyces paradoxus*, Ecology, Mating, Evolution

