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BOOK OF ABSTRACTS

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The impact of heat treatment on metabolic profiles of fungi belong to *Neosartorya* genus

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Abstract

The fungi of *Neosartorya* genus belong to phylum *Ascomycota* which is ubiquitous in soil throughout the world and they are involved in the spoilage of thermally processed fruit products. This fungi can grow even under reduced oxygen conditions. Moreover *Neosartorya* has been known to produce mycotoxins which can cause humans health problems [2]. *Neosartorya* is able to sexual reproduction involving the formation fruits bodies named cleistothecia. Cleistothecia contain asci with ascospores. Nevertheless, ascospores are main vehicle for dispersion mainly via air and water [1,2]. Ascospores of *Neosartorya* have been reported to be resistant against desiccation, high pressure and heating [4]. They are able to survive pasteurization treatments and even temperatures above 85°C even for 100 min [4]. They are considered to be the most stress-resistant eukaryotic cells [3,4]. The pasteurization treatment can even break the dormancy of the ascospores leading to germination [4]. The major solutes in fungal cells are sugar trehalose and polyols glycerol, erythritol, arabitol and mannitol. These molecules are compatible whit cellular functioning even when present at high concentration. Stress-resistant ascospores contain large amounts of trehalose, trehalose-based oligosaccharides and mannitol [4].

The aim of the study was to evaluate the metabolic pattern of seven strains of *Neosartorya* (Tab. 1.) after heat shock (80°C, 30 min) under aerobic conditions (21% O_2) and microaerophilic conditions (6% O_2). Metabolic profile was evaluated using FF microplates (Biolog™). We obtained data on utilization of 95 carbon sources from different groups: carbohydrates, amino acids, amines and amides, polymers, carboxylic acids and miscellaneous substrates. Optical density (OD) was measured at 750nm wavelength. Metabolic profile was expressed as average well-colour development (AWCD).

Tab. 1 Tested strains (NBRC - NITE Biological Resource Center, (NITE - National Institute of Technology and Evaluation) Tokyo, Japan; LMMiŚ - Laboratory of Molecular and Environmental Microbiology).

Species	Colection	Izolation year	Strain number
N. fischeri var. fischeri	NBRC 31895	1985	G90/14
N. fischeri var. glabra	NBRC 30572	1975	G91/14
N. fischeri	LMMiŚ	2014	G126/14
N. fischeri	LMMiŚ	2014	G128/14
N. fischeri	LMMiŚ	2014	G131/14
N. fischeri	LMMiŚ	2014	G153/14
N. fischeri	LMMiŚ	2014	G168/14

Studies revealed that all strains of *Neosartorya* grow after the heat shock. Five of the seven strains showed not significantly lower growth in reduced oxygen concentration. It was revealed intraspecific variation in metabolic profile of heat-resistant *Neosartorya fischeri* strains (Fig. 1). In general, tested strains utilized higher number of substrates in aerobic conditions compared to microaerophilic conditions (Fig. 2).

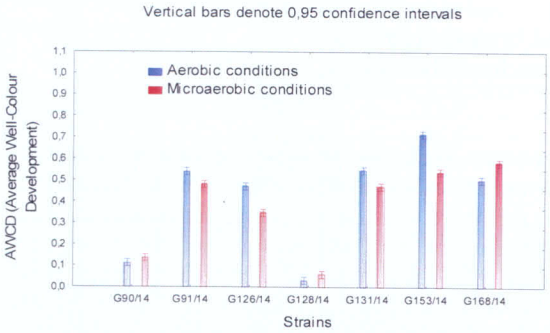

Fig.1 The metabolic profiles for particular isolates.

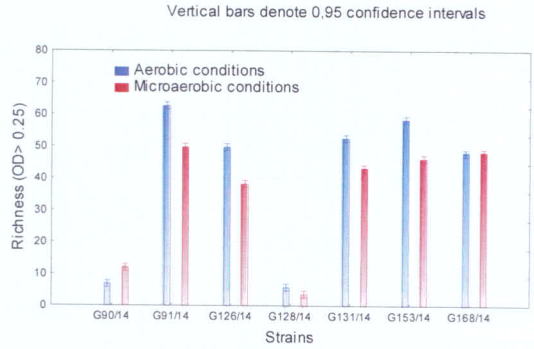

Fig.2. The number of substrate utilised by particular isolates.

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