Global carbon utilization profiles of two heat-resistant strains of *Neosartorya fischeri* using phenotype microarray (PM plates)

Frąc M., Bilińska N., Panek J., Oszust K., Gryta A.

Instytut Agrofizyki Polskiej Akademii Nauk, ul. Doświadczalna 4, 20-290 Lublin 27, tel.: (81) 744 50 61, e-mail: *m.frac@ipan.lublin.pl; n.bilinska@ipan.lublin.pl*

Spoilage by heat-resistant molds of thermally processed fruit products is a serious economic problem. Moreover these fungi can produce mycotoxins and therefore are major concern to public health. One of the most dangerous and common heat-resistant fungi are strains belonging to the species of *Neosartorya fischeri*. The aim of presented study was to evaluate carbon sources utilization profiles of *N. fischeri* strains.

The phenotype microarray system (PMs) was used to collect information about global carbon utilization profiles (190 carbon sources) of *Neosartorya fischeri*. PMs was used to evaluate capability of carbon sources utilization of two *Neosartorya fischeri* strains: reference (DSM 3700) and environmental (G48_12).

DSM 3700 stain was purchased from DSMZ (Braunschweig, Germany), isolate come from canned apples. G48_12 was isolated in Laboratory of Molecular and Environmental Microbiology, Institute of Agrophysics PAS (GenBank: KC179765). Strain was isolated from strawberries product and identified as *N. fischeri* (Frąc et al., 2012) based on large subunit ribosomal RNA gene partial sequence. *N. fischeri* strains were cultured on PDA medium for 14 days in the dark at 27°C.

Substrate utilization screening of *N. fischeri* strains were analyzed following the OmniLog Phenotype MicroArray technology provided by Biolog (Biolog, Inc., Hayward, CA). Global carbon assimilation profiles were evaluated using PM1 and PM2 MicroPlates. Each of them contains 95 wells with a different carbon-containing compound. After inoculation PMs were incubated in OmniLOG at 26°C for 96 hours. The Phenotype MicroArray (PM) software was used to analyzed the PM results.

The most consumed carbohydrates by environmental strain were respectively: Arbutin, D-Mannose, L-Arabinose, N-Acetyl-D-glucosamine. For the reference strain there were Arbutin and also: D-Trehalose, D-Galactose and D-Raffinose, D-Mannose. Both L-Arabinose and Sucrose were much more actively consumed by the environmental strain. D-Galactose and α-D-Glucose have been used by both strains. Ribose was also consumed by both isolates, although the G48_12 *N. fischeri* utilized it more intensive. None of the examined strains of *N. fischeri* used D-Fructose, while only environmental strain largely used carbohydrates such as Xylose, L-Rhamnose and Maltose.

Global carbon utilization analyses indicated that the *N. fischeri* environmental isolate is able to metabolize a wide range of carbon sources, however reference stain revealed narrower spectrum of substrates with lower intensity.

The study was supported by National Science Centre (Poland), grant: DEC-2012/07/D/NZ9/03357.

NARODOWE CENTRUM NAUKI SONATA 4

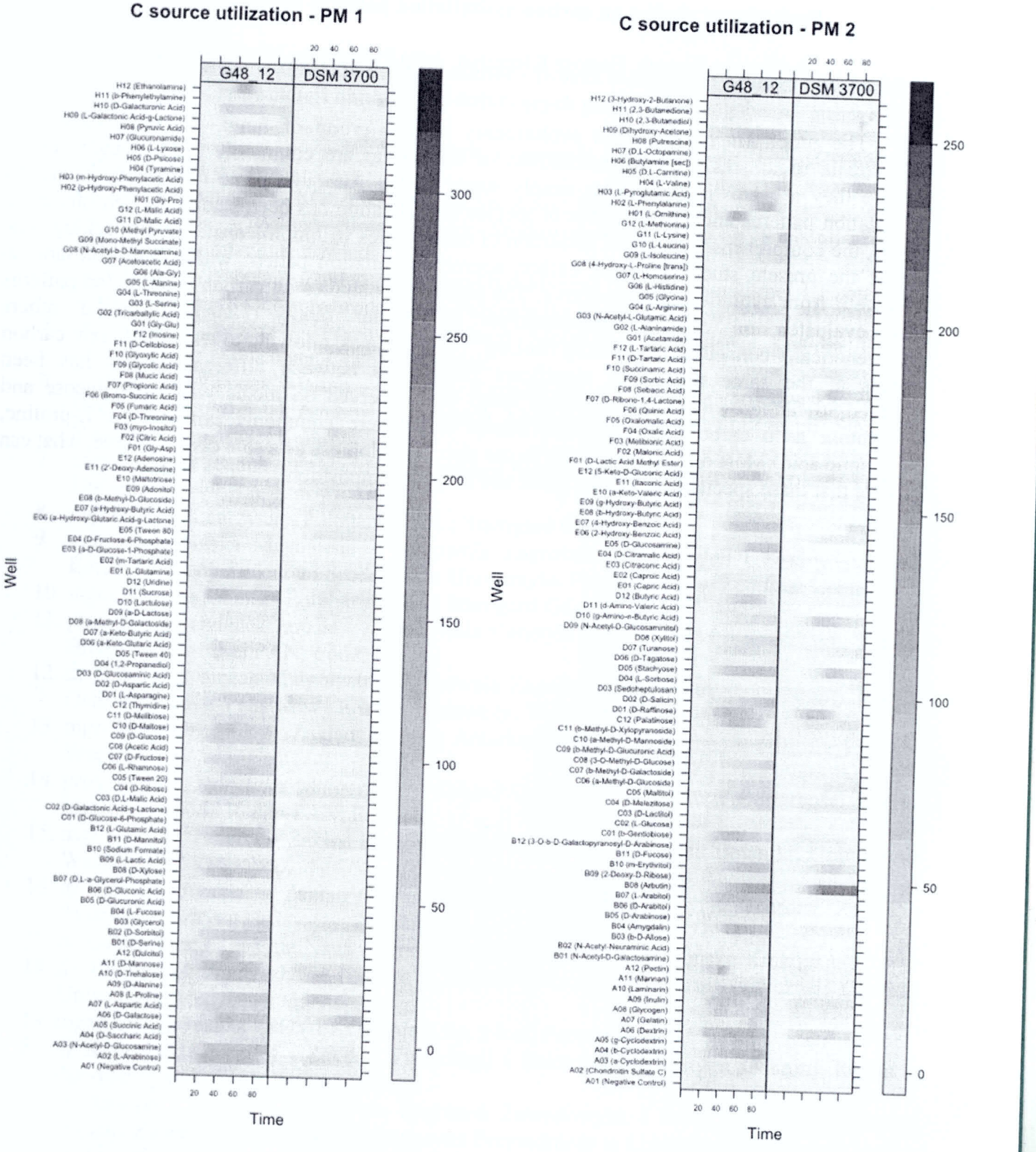

Fig. 1. Graphical depiction of carbon sources utilization by *Neosartorya fischeri* DSM 3700 and G48_12 strains.

BioMaxima

„Innowacyjne zastosowania przełomowej technologii Biolog do identyfikacji i fenotypowania mikroorganizmów"

Organizator:

BioMaxima S.A.
Centrum Mikrobiologii Emapol
ul. Budowlanych 68
80-298 Gdańsk

Warszawa, 03.04.2014