

YT MicroPlate™

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| A1 water | A2 acetic acid | A3 formic acid | A4 propionic acid | A5 succinic acid | A6 methyl succinate | A7 L- aspartic acid | A8 L- glutamic acid | A9 L- proline | A10 D- gluconic acid | A11 dextrin | A12 inulin |
| B1 cellobiose | B2 gentiobiose | B3 maltose | B4 maltotriose | B5 D- melezitose | B6 D- melibiose | B7 palatinose | B8 D- raffinose | B9 stachyose | B10 sucrose | B11 D- trehalose | B12 turannose |
| C1 N-acetyl-D- glucosamine | C2 a-D- glucose | C3 D- galactose | C4 D- psicose | C5 L- sorbose | C6 salicin | C7 D- mannitol | C8 D- sorbitol | C9 D- arabitol | C10 xyllitol | C11 glycerol | C12 tween 80 |
| D1 water | D2 fumaric acid | D3 L- malic acid | D4 methyl succinate | D5 bromo succinic acid | D6 L- glutamic acid | D7 g-amino butyric acid | D8 a-keto- glutaric acid | D9 2-keto-D- gluconic acid | D10 D- gluconic acid | D11 dextrin | D12 inulin |
| E1 cellobiose | E2 gentiobiose | E3 maltose | E4 maltotriose | E5 D- melezitose | E6 D- melibiose | E7 palatinose | E8 D- raffinose | E9 stachyose | E10 sucrose | E11 D- trehalose | E12 turannose |
| F1 N-acetyl-D- glucosamine | F2 D- glucosamine | F3 a-D- glucose | F4 D- galactose | F5 D- psicose | F6 L- rhamnose | F7 L- sorbose | F8 a-methyl D- glucoside | F9 b-methyl D- glucoside | F10 amygdalin | F11 arbutin | F12 salicin |
| G1 maltitol | G2 D- mannitol | G3 D- sorbitol | G4 adonitol | G5 D- arabitol | G6 xyllitol | G7 l- erythritol | G8 glycerol | G9 tween 80 | G10 L- arabinose | G11 D- arabinose | G12 D- ribose |
| H1 D- xylose | H2 methyl succinate + D-xylose | H3 N-acetyl-L- glutamic acid + D-xylose | H4 quinic acid + D-xylose | H5 D- glucuronic acid + D-xylose | H6 dextrin + D-xylose | H7 a-D- lactose + D-xylose | H8 D- melibiose + D-xylose | H9 D- galactose + D-xylose | H10 m- inositol + D-xylose | H11 1,2- propanediol + D-xylose | H12 acetoin + D-xylose |

The layout of tests in the YT MicroPlate is shown above.



Oxidation Tests



Assimilation Tests

The YT MicroPlate provides a broad capability for identification and characterization of yeast strains, including both human isolates and environmental species. Yeast are of particular importance in the food industry, both in food production and in food spoilage. They are also important in human health both as normal flora (e.g. in the gastrointestinal tract) and as occasional pathogens. Recently there has been a renewed interest in the use of yeasts as “probiotics” to beneficially influence the ecology of the digestive tract and the ecology of plant surfaces.

The unique physiological properties of yeast have made them relatively difficult to test and identify. Yeast tend to thrive in low pH and high sugar environments. Most species have a slower growth rate and metabolism as compared to common bacteria. The Biolog System, however, makes them nearly as easy to identify as bacteria. The testing protocol is a very simple one: 1) the strain of interest is cultured on a special agar medium, BUY™ Agar (available from Biolog either as a dry powder - Catalog No. 70005 or already prepared in petri plates - Catalog No. 71005), 2) cells are removed from the surface of the agar with a sterile swab and suspended in sterile water at the specified density, 3) 100 ul of the cell suspension is inoculated into each of the 96 wells of the Biolog YT MicroPlate (carbon sources shown schematically above), and

4) the MicroPlate is incubated at 26°C for 24, 48, or 72 hours until a sufficient metabolic pattern is formed.

Some yeast species are inhibited by the tetrazolium violet redox dye used in Biolog MicroPlates, so the YT MicroPlate is configured with both oxidation tests and assimilation tests. The first 3 rows of the panel (rows A - C) contain carbon source oxidation tests using tetrazolium violet as a colorimetric indicator of oxidation. The next five rows of the panel (rows D - H) contain carbon source assimilation tests. Results from these tests are scored turbidimetrically. The last row of the panel (row H) has wells that contain 2 carbon sources. These wells test for the co-utilization of various carbon sources with D-xylose.

For manual characterization of yeast strains, reactions may be read by eye. Oxidation tests in rows A-C should be read against a white background and assimilation tests in rows D-H should be read against a black background. Depending on the strain, some reactions may be faint and difficult to read by eye.

For species identification, the YT MicroPlate must be read with the Biolog MicroStation Reader. A list of the 267 species of yeast currently identified by the Biolog System is shown on the back of this sheet.

The Yeast Data Base contains identification patterns for the 267 yeast species shown below. This data base is used only with automated systems, and is available on both 3 1/2 inch diskettes (Catalog No. 2205A) and 5 1/4 inch diskettes (Catalog No. 2205B). It is compatible with DOS-based personal computers.

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| ARTHROASCUS JAVANENSIS | CANDIDA TROPICALIS A | ISSATCHENKIA ORIENTALIS | RHODOTORULA ARAUCARIAE |
| BULLEROMYCES ALBUS | CANDIDA TROPICALIS B | ISSATCHENKIA SCUTULATA | RHODOTORULA AURANTIACA A |
| CANDIDA AASERI A | CANDIDA VANDERWALTII | ISSATCHENKIA SCUTULATA VAR | RHODOTORULA AURANTIACA B |
| CANDIDA AASERI B | CANDIDA VARTIOVAARAI | EXIGUA | RHODOTORULA BACARUM |
| CANDIDA ALBICANS | CANDIDA VERSATILIS | ISSATCHENKIA SCUTULATA VAR | RHODOTORULA GLUTINIS |
| CANDIDA APICOLA | CANDIDA VISWANATHII | SCUTULA | RHODOTORULA GLUTINIS VAR |
| CANDIDA AZYMA | CANDIDA WICKERHAMII | KLUYVEROMYCES DELPHENSIS | GLUTINIS |
| CANDIDA BLANKII | CANDIDA ZEYLANOIDES | KLUYVEROMYCES LACTIS | RHODOTORULA GRAMINIS |
| CANDIDA BOIDINII | CITEROMYCES MATRITENSIS | KLUYVEROMYCES LODDERAE | RHODOTORULA HYLOPHILA |
| CANDIDA BOMBI | CLAVISPORA LUSITANIAE | KLUYVEROMYCES MARXIANUS | RHODOTORULA MINUTA |
| CANDIDA CANTARELLI | CRYPTOCOCCUS ALBIDUS | KLUYVEROMYCES | RHODOTORULA MINUTA VAR |
| CANDIDA CARIOSILIGNICOLA | CRYPTOCOCCUS ALBIDUS VAR | THERMOTOLERANS | MINUTA |
| CANDIDA CASTELLII | AERIUS | KLUYVEROMYCES WICKERHAMII | RHODOTORULA MUCILAGINOSA |
| CANDIDA CATENULATA | CRYPTOCOCCUS ALBIDUS VAR | KURTZMANOMYCES NECTAIREI | RHODOTORULA MUSCORUM |
| CANDIDA DIDDENSIAE | ALBIDUS | LODDEROMYCES ELONGISPORUS | RHODOTORULA PHILYLA |
| CANDIDA DIVERSA | CRYPTOCOCCUS ALBIDUS VAR | METSCHNIKOWIA PULCHERRIMA | RHODOTORULA PUSTULA |
| CANDIDA EDAX | DIFFLUENS | METSCHNIKOWIA REUKAUFII | SACCHAROMYCES BAYANUS |
| CANDIDA ENTOMOPHILA | CRYPTOCOCCUS AMYLOLENTUS | METSCHNIKOWIA ZOBELLII | SACCHAROMYCES BOULARDII |
| CANDIDA ERGASTENSIS | CRYPTOCOCCUS CURVATUS A | NADSONIA FULVESCENS | SACCHAROMYCES CEREVISIAE A/ |
| CANDIDA ETCHELLSII | CRYPTOCOCCUS CURVATUS B | PACHYSOLEN TANNOPHILUS | TOR.PRETORIENSIS |
| CANDIDA FAMATA | CRYPTOCOCCUS DIMENNAE | PHAFFIA RHODOZYMA | SACCHAROMYCES CEREVISIAE B |
| CANDIDA FLUVIATILIS | CRYPTOCOCCUS GASTRICUS | PICHIA ALNI | SACCHAROMYCES DAIRENSIS |
| CANDIDA FREYSCHUSSII | CRYPTOCOCCUS KUETZINGII | PICHIA AMENTHIONINA VAR | SACCHAROMYCODES LUDWIGII |
| CANDIDA FRIEDRICHII | CRYPTOCOCCUS LAURENTII | AMETHONINA | SACCHAROMYCOOPSIS CAPSULARIS |
| CANDIDA FRUCTUS | CRYPTOCOCCUS LUTEOLUS | PICHIA AMENTHIONINA VAR PACHY | SATURNOSPORA DISPORA |
| CANDIDA FUSIFORMATA | CRYPTOCOCCUS MACERANS | PICHIA AMYLOPHILA/MISSISSIPPIENSIS | SCHIZOBLASTOSPORON STARKEYI- |
| CANDIDA GALACTA | CRYPTOCOCCUS MAGNUS | PICHIA ANGUSTA | HENRICII |
| CANDIDA GEOCHARES | CRYPTOCOCCUS MAGNUS VAR | PICHIA ANOMALA | SCHIZOSACCHAROMYCES JAPONICUS |
| CANDIDA GLABRATA | AERIUS | PICHIA BISPORA | SCHIZOSACCHAROMYCES JAPONICUS |
| CANDIDA GLAEBOSA | CRYPTOCOCCUS MARINUS | PICHIA CANADENSIS | VAR JAPONICUS |
| CANDIDA GROPENGIESSERI | CRYPTOCOCCUS SKINNERI | PICHIA CARSONII | SCHIZOSACCHAROMYCES |
| CANDIDA HAEMULONII | CRYPTOCOCCUS TERREUS A | PICHIA ETCHELLSII | OCTOSPORUS |
| CANDIDA HUMILIS | CRYPTOCOCCUS TERREUS B | PICHIA FABIANII | SCHIZOSACCHAROMYCES POMBE |
| CANDIDA INCOMMUNIS | CRYPTOCOCCUS TSUKUBAENSIS | PICHIA FARINOSA/MUSCICOLA | SCHIZOSACCHAROMYCES POMBE |
| CANDIDA INSECTALENS | DEBARYOMYCES CASTELLII | PICHIA FERMENTANS | VAR MALIDEVORANS |
| CANDIDA INSECTAMANS | DEBARYOMYCES HANSENII A | PICHIA FLUXUUM | SCHWANNIOMYCES OCCIDENTALIS |
| CANDIDA INSECTORUM | DEBARYOMYCES HANSENII B | PICHIA GLUCOZYMA/METHANOLICA | SPORIDILOBOLUS JOHNSONII A |
| CANDIDA INTERMEDIA | DEBARYOMYCES HANSENII C | PICHIA GUILLIERMONDII A | SPORIDILOBOLUS JOHNSONII B |
| CANDIDA ISHIWADAE | DEBARYOMYCES HANSENII VAR | PICHIA GUILLIERMONDII B | SPORIDILOBOLUS JOHNSONII C |
| CANDIDA MAGNOLIAE | FABRYI | PICHIA HAPLOPHILA | SPORIDILOBOLUS PARAROSEUS A |
| CANDIDA MALTOSA | DEBARYOMYCES MARAMUS | PICHIA HOLSTII | SPORIDILOBOLUS PARAROSEUS B |
| CANDIDA MARIS | DEBARYOMYCES POLYMORPHUS | PICHIA JADINII | SPOROBOLOMYCES ALBO-RUBESCENS |
| CANDIDA MARITIMA | DEBARYOMYCES VANRIJIAE | PICHIA KLUYVERI | SPOROPACHYDERMIA CEREANA |
| CANDIDA MELIBIOSICA | DEKKERA ANOMALA | PICHIA MEDIA | SPOROPACHYDERMIA LACTATIVORA |
| CANDIDA MOGII | DEKKERA BRUXELLENSIS A | PICHIA MEMBRANAEEFACIENS | STEPHANOASCUS CIFERRII |
| CANDIDA MONTANA | DEKKERA BRUXELLENSIS B | PICHIA MEXICANA | STERIGMATOMYCES ELVIAE |
| CANDIDA MULTISGEMMIS | DEKKERA CUSTERIANA | PICHIA MINUTA | STERIGMATOMYCES HALOPHILUS |
| CANDIDA MUSAE | DEKKERA NAARDENENSIS | PICHIA MUSCICOLA | TORULASPORA DELBRUECKII |
| CANDIDA NEMODENDRA | DIPODASCUS CAPITATUS | PICHIA NORVEGENSIS | TORULASPORA GLOBOSA |
| CANDIDA NITRATOPHILA | DIPODASCUS OVETENSIS | PICHIA OHMERI A | TRICHOSPORON BEIGELII A |
| CANDIDA NORVEGICA | ENDOMYCES FIBULIGER | PICHIA OHMERI B | TRICHOSPORON BEIGELII B |
| CANDIDA OLEOPHILA | ENDOMYCOSELLA VIVI | PICHIA ONYCHIS | TRICHOSPORON BRASSICAE |
| CANDIDA PARAPSILOSIS A | EREMOTHECIUM ASHBYI | PICHIA OPUNTIAE | TRICHOSPORON INKIN |
| CANDIDA PARAPSILOSIS B | FELLOMYCES FUZHOUENSIS | PICHIA PASTORIS | TRIGONOPSIS TRIANGULARIS/ |
| CANDIDA PARARUGOSA | FILOBASIDIELLA NEOFORMANS | PICHIA PETERSONII | VARIABILIS |
| CANDIDA PELTATA | VAR BACILLISPORUS | PICHIA PIJPERI | USTILAGO MAYDIS |
| CANDIDA PINUS | FILOBASIDIELLA NEOFORMANS | PICHIA PINI | WICKERHAMIELLA DOMERCQIAE |
| CANDIDA RUGOSA A | VAR NEOFORMANS A | PICHIA RABAULENSIS | WILLIOPSIS CALIFORNICA |
| CANDIDA RUGOSA B | FILOBASIDIELLA NEOFORMANS | PICHIA RHODANENSIS | WILLIOPSIS SATURNUS |
| CANDIDA SAKE | VAR NEOFORMANS B | PICHIA SILVICOLA | WILLIOPSIS SATURNUS VAR MRAKII |
| CANDIDA SALMANTICENSIS | FILOBASIDIUM UNIGUTTULATUM | PICHIA SPARTINAE | WILLIOPSIS SATURNUS VAR |
| CANDIDA SANTAMARIAE | GALACTOMYCES GEOTRICHUM | PICHIA STIPITIS | SATURNUS |
| CANDIDA SAVONICA | GEOTRICHUM TERRESTRE | PICHIA SUBPELLICULOSA | WINGEA ROBERTSIAE |
| CANDIDA SHEHATAE | GUILLIERMONDELLA | PICHIA SYDOWIORUM | YARROWIA LIPOLYTICA |
| CANDIDA SHEHATAE VAR SHEHATAE | SELENOSPORA | PICHIA THERMOTOLERANS | ZYGOASCUS HELLENICUS |
| CANDIDA SILVAE | HANSENIASPORA GUILLIERMONDII/ | PICHIA TOLETANA | ZYGOSACCHAROMYCES BAILII |
| CANDIDA SILVATICA | UVARUM/VALBYENSIS | PICHIA TREHALOPHILA | ZYGOSACCHAROMYCES BISPORUS |
| CANDIDA SOLANI | HANSENIASPORA OCCIDENTALIS | PICHIA TRIANGULARIS | ZYGOSACCHAROMYCES CIDRI |
| CANDIDA SONORENSIS | HANSENIASPORA OSMOPHILA/ | RHODOSPORIDIUM DIOBOVATUM | ZYGOSACCHAROMYCES FERMENTATI |
| CANDIDA SORBOPHILA | VINEAE | RHODOSPORIDIUM SPHAEROCARPUM | ZYGOSACCHAROMYCES |
| CANDIDA SORBOXYLOSA | HYPHOPICHIA BURTONII A | RHODOSPORIDIUM TORULOIDES | FLORENTINUS |
| CANDIDA SPANDOVENSIS | HYPHOPICHIA BURTONII B | RHODOTORULA ACHENIORUM | ZYGOSACCHAROMYCES |
| CANDIDA SUCCIPHILA | HYPHOPICHIA BURTONII C | RHODOTORULA ACUTA | MICROELLIPSOIDES/MRAKI |
| | | | ZYGOSACCHAROMYCES ROUXII |