



IDENTIFICATION OF MICROORGANISMS IN WINE

Bacteria

Acetobacter: Typically medium rods, often irregularly shaped rods with rounded or tapered ends. Usually single or in pairs in wine, but may form chains and/or clumps. Forms a film on wine when in contact with air. These bacteria are aerobic, usually catalase positive, and gram negative.

Acetobacter colonies usually appear within 48 hours and produce acid which changes the color of the WL nutrient media. Generally the colonies are larger than those of lactic acid bacteria. Often, *Acetobacter* colonies take up the color of the media (i.e., dark green on WL, clear to brownish on AR).

Lactic Acid Bacteria: Colonies are generally slow to appear (5-7 days), remain small, and generally do not change the color of the WL media. They are usually clear to whitish in color on AR or YM, but often green on WL. Colonies are usually smaller than those of acetic acid bacteria, but are often quite similar to those of other species of lactic acid bacteria. These bacteria are anaerobic, catalase negative, and gram positive.

Oenococcus: Small coccoidal rods in pairs and chains. Some strains may form long rods and most can form long chains in a nutrient rich environment.

Pediococcus: Small cocci in pairs and tetrads (formed by division in all planes). Brightly refractive in phase contrast.

Lactobacillus: Long and slender or blocky rods of variable length, usually with fairly squared ends. Usually found as single cells or in pairs in wine. Brightly refractive in phase contrast.

Non-Wine bacteria:

Bacillus: Large, granular, endospore forming rods in chains or clumps. Catalase positive. Colonies are often flat and large. They can have a wrinkled surface or bumps and may be irregularly shaped.

Other: Usually rod shaped, some cocci shaped cells in clumps. Sometimes motile organisms. Catalase positive.



Inspiring innovation.



Yeast

Saccharomyces: Colonies are conical, usually appear within 48 hours, produce acid, may be cream colored or may absorb various amounts of color from WL media. Colonies typically have round margins.

Cells are usually large (5-10 μm) and round to ovoid in shape. There is great variability between *Saccharomyces* strains. Actidione sensitive.

Glucose fermentation test: positive within 48 hours; produces gas without a surface film.

Brettanomyces: Colonies are bright white, hemispherical on YM+ 30ppm Actidione, round margins, and slow to appear (5-7 days). Plates often give off a pungent aroma. Actidione resistant.

Cells large or small, ogive or ovoid, multilateral budding polymorphic yeast with remaining visible bud scars.

Brettanomyces confirmation test: most will form a clearing zone on YM+CaCO₃ media within 72 hours.

Kloeckera: Colonies are conical, absorb various amounts of WL color, and are similar in appearance to some *Saccharomyces* species. Often Actidione resistant.

Cells large or small, ovoid to lemon shaped; bud repeatedly from two opposite ends. Also referred to as apiculate yeast.

Film Yeasts: Colonies usually appear within 48 hours, may have dull and/or wrinkled surfaces, and often have ragged margins. Some are resistant to Actidione.

Cells are often large, elongate, or cylindrical. May form pseudohyphae.

Glucose fermentation test: a negative result forms a pellicle and/or a film, usually without the production of gas. Some may ferment glucose and would produce gas.

Most film yeasts cannot ferment glucose and require oxygen. Film yeasts which can ferment glucose are also gas producing.

Non-wine yeasts:

Usually do not ferment glucose. Pink colonies, cells are round, small to medium in size. *Rhodotorula* typically fits this description.