

**Exercise #4. Distribution of Microorganisms in the Environment. p. 10**

**Objective:**

- Observe presence of microorganisms in a variety of selected environments
- Observe variety of colony forms and characteristics
  - **Colony shape / size** (circular, irregular, punctiform)
  - **Margins:** entire (smooth, with no irregularities), undulate (wavy), lobate (lobed), filamentous, or rhizoid (branched like roots)
  - **Colony elevations** (flat, raised, convex, pluvinate (very convex), umbonate (raised in the center))
  - **Colony texture** (moist, mucoid, dry, butyrous-buttery)
  - **Pigment production** (may be influenced by environmental factors such as temperature or nutrient supply)
  - **Colony optical properties** (opaque, translucent, shiny, dull)
  - **Variety of microbes** (yeasts? bacteria? molds)

**Media:**

- Nutrient Agar, pH 6.6-7.0
- Malt agar, pH 5.2-5.7

**Purpose of experiment:**

- ...lots of terms (see below)!
  - BUT, understand that they are designed to make descriptions easier
  - It helps to recognize characteristics that are important in indentifying microbes

<p><b>Day 1</b></p>	<p><b>Procedure:</b></p> <ul style="list-style-type: none"> <li>• Work in groups of 2</li> <li>• Inoculate 2 agar plates each person in pair                             <ul style="list-style-type: none"> <li>○ Each person select a surface to swab</li> <li>○ Each person inoculate 2 plates with swabs from the same surface                                     <ul style="list-style-type: none"> <li>▪ 1 NA</li> <li>▪ 1 MA</li> </ul> </li> </ul> </li> <li>• INCUBATE: 37°C; 48 hours</li> </ul>	<p><b>Organisms:</b></p> <p>1. unknowns</p>
<p><b>Day 2</b></p> <p>And, if necessary</p> <p><b>Day 3</b></p>	<p><b>Results:</b></p> <ul style="list-style-type: none"> <li>• observe plates / colonies for the characteristics listed above                             <ul style="list-style-type: none"> <li>○ Use these terms to describe colonial morphology</li> </ul> </li> <li>• Make drawings / diagrams of your plates                             <ul style="list-style-type: none"> <li>○ Include labels in your sketches</li> </ul> </li> <li>• Check your results with the information provided in file....</li> </ul>	

**Terms and Descriptions:** (see also Lab Manual, p. 30)

Term	Description
Colony shape and size	<ul style="list-style-type: none"> <li>• Measure with a millimeter rule), less than 1mm = punctiform (pin-point)</li> <li>• Punctiform, circular, rhizoid, irregular, filamentous</li> </ul>
Margins / Edge	<ul style="list-style-type: none"> <li>• Magnify the edge to see the shape</li> <li>• Entire, undulate, lobate, curled</li> </ul>
Chromogenesis (pigmentation)	<ul style="list-style-type: none"> <li>• White, buff, red, purple, etc.</li> <li>• Some pigment are water-soluble, others not</li> <li>• Take a large inoculum and place it in a tube of water or saline, do you see color?</li> <li>• Do you see any pigment if the organism is growing in a broth medium?</li> </ul>
Opacity of Colony	<ul style="list-style-type: none"> <li>• Transparent (clear)</li> <li>• Opaque to transmitted light</li> <li>• Translucent (almost clear, but distorted vision – like looking through frosted glass)</li> <li>• Iridescent (changing colors in reflected light)</li> </ul>
Elevation of Colony	<ul style="list-style-type: none"> <li>• Turn the plate on end to determine height</li> <li>• Flat, raised, convex, umbonate</li> </ul>
Surface of Colony	<ul style="list-style-type: none"> <li>• Smooth</li> <li>• Glistening</li> <li>• Rough</li> <li>• Dull (opposite of glistening)</li> <li>• Rugose (wrinkled)</li> <li>• Dry</li> <li>• Powdery</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>• Butyrous (buttery)</li> <li>• Viscid (sticks to loop, hard to get off)</li> <li>• Brittle / friable (dry, breaks apart)</li> <li>• Mucoid</li> </ul>
Emulsifiability of Colony	<ul style="list-style-type: none"> <li>• Is it easy or difficult to emulsify?</li> <li>• Does it form a uniform suspension, a granular suspension or does it not emulsify at all?</li> </ul>
Odor	<ul style="list-style-type: none"> <li>• Absent?</li> <li>• Present?</li> <li>• If it has an odor, what does it smell like?</li> </ul>