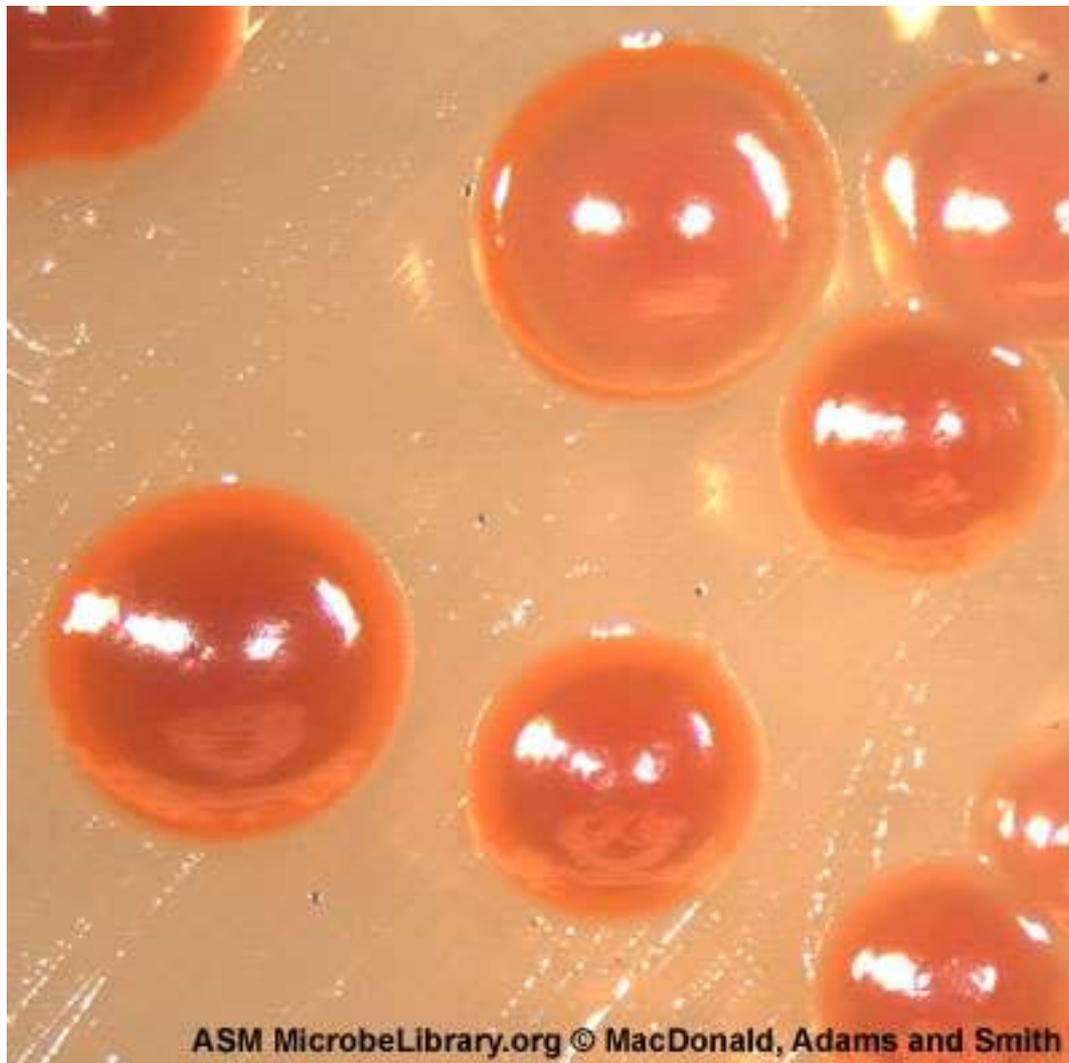


# Colony Morphology

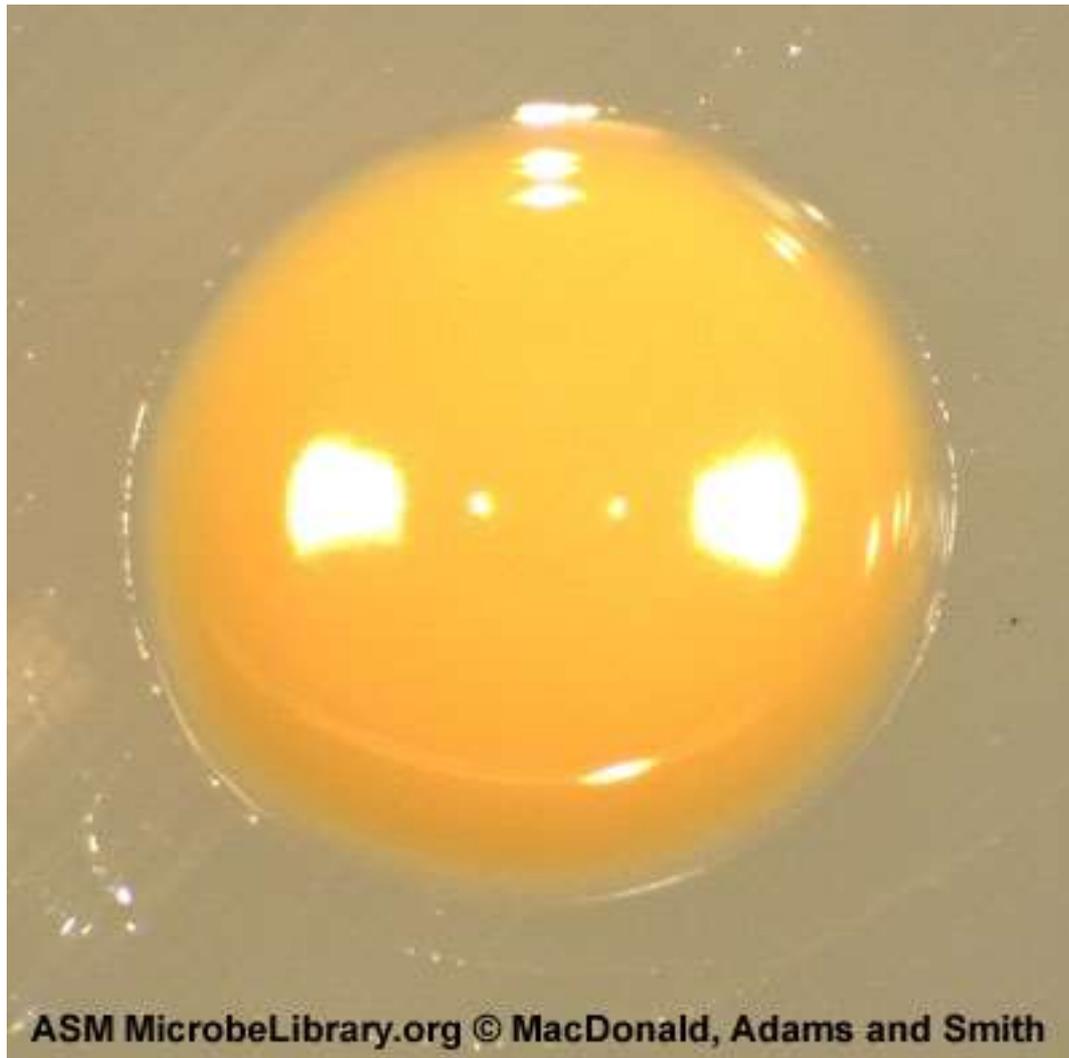
Authors: Donald Breakwell, Bryan MacDonald, Christopher Adams, Kyle Smith, Richard Robison

Citation: Donald Breakwell, Bryan MacDonald, Christopher Adams, Kyle Smith, Richard Robison. 2007. Colony morphology.

Publication Date: September 2007

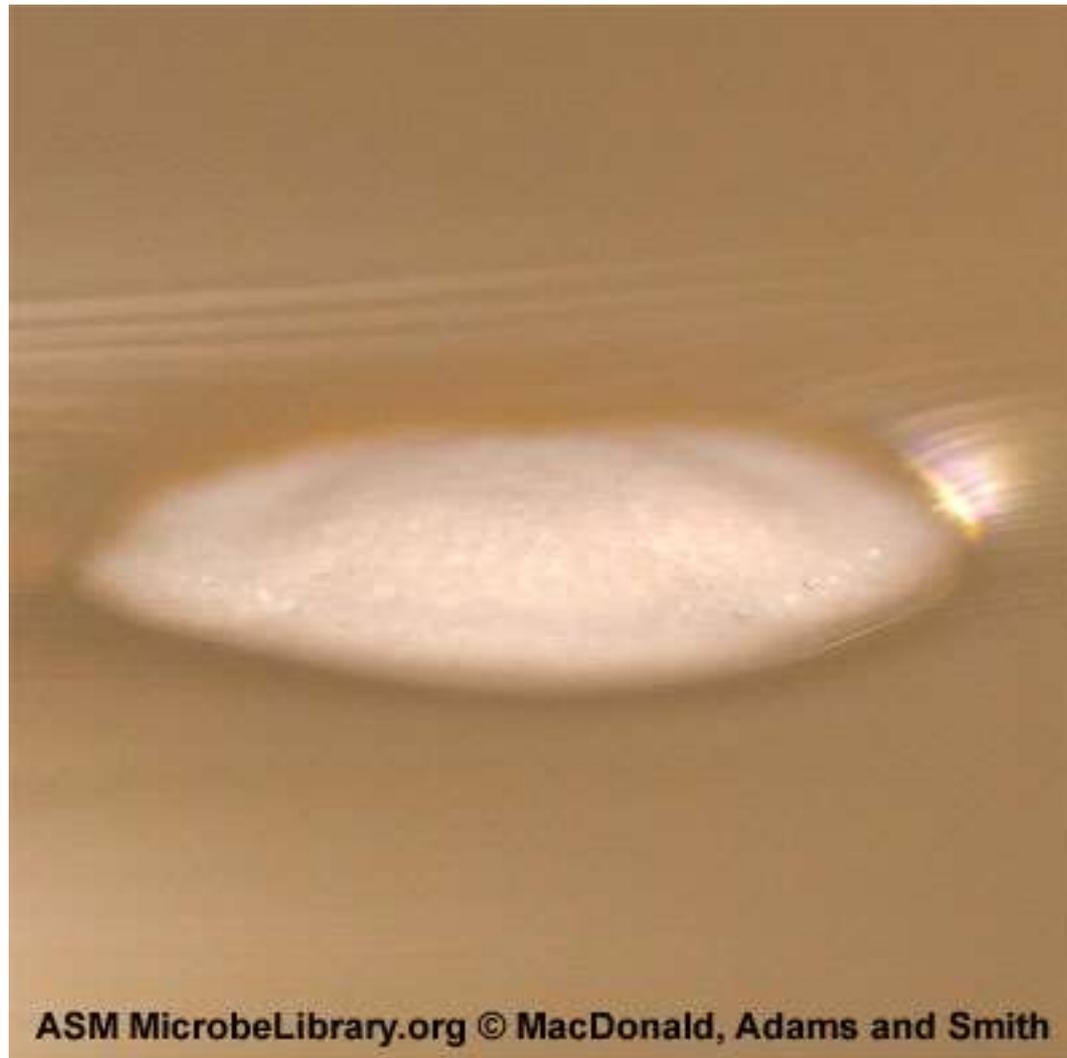


*Serratia marcescens* morphology (Enlarged view) FIG. 1. Circular form. *Serratia marcescens* cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)

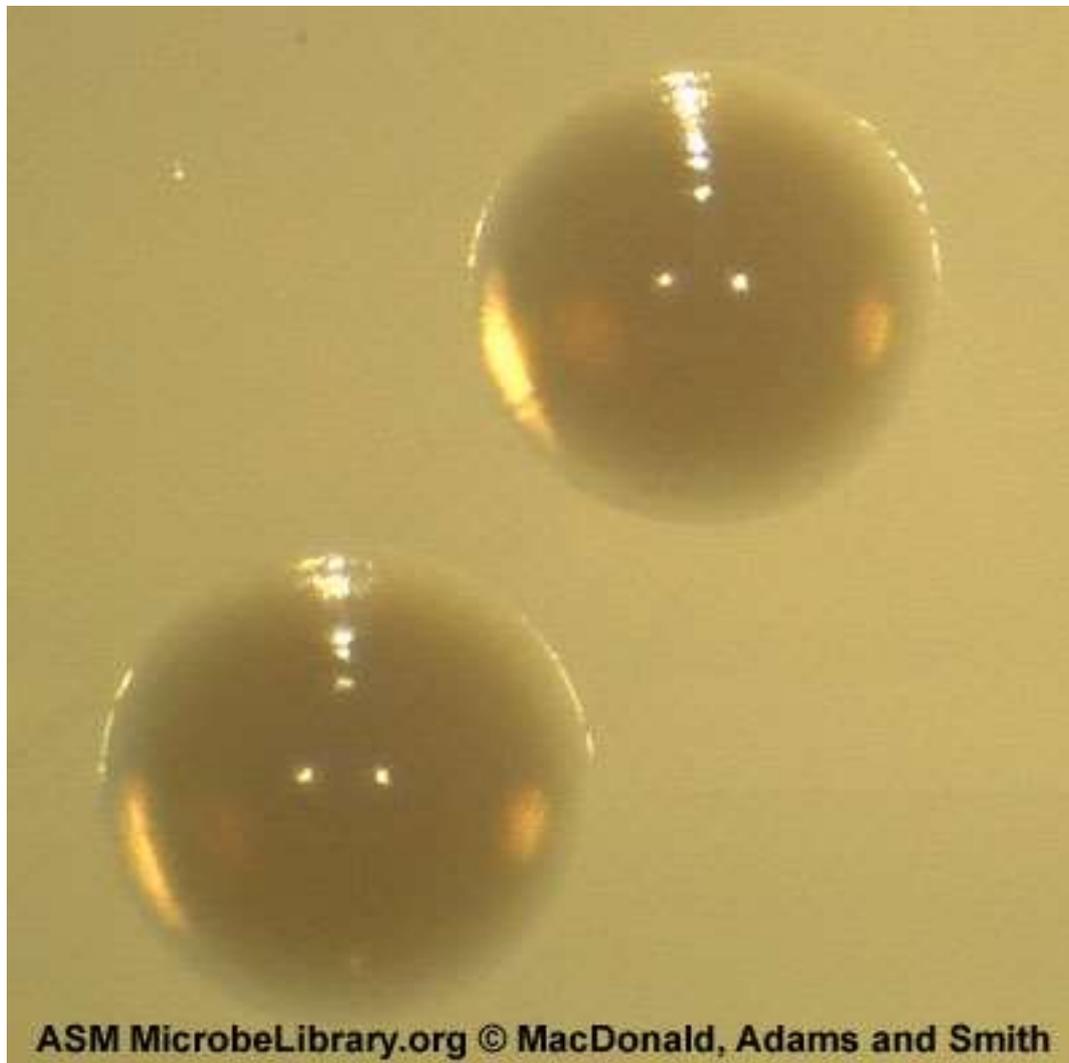


*Staphylococcus aureus* morphology (Enlarged view)

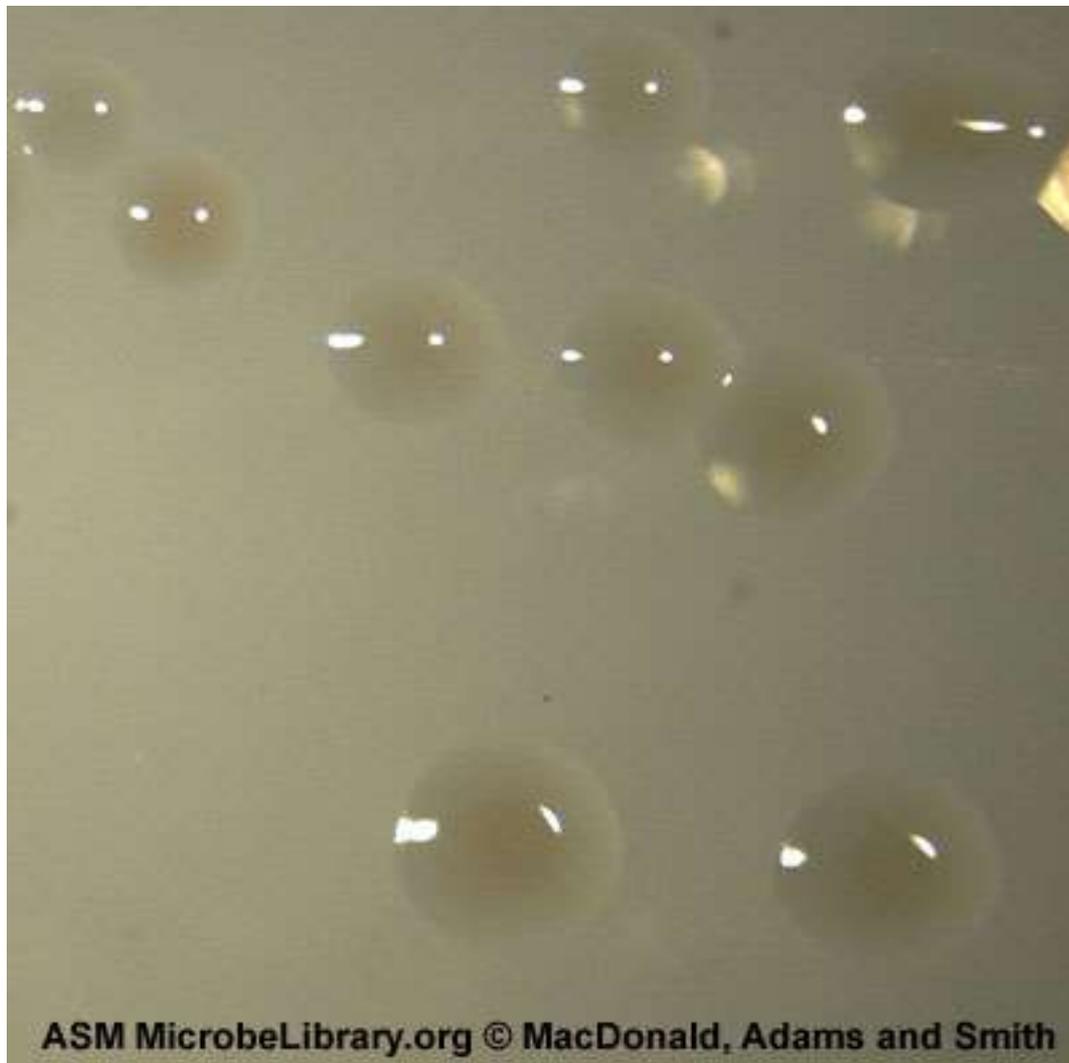
FIG. 2. Circular form. *Staphylococcus aureus* cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



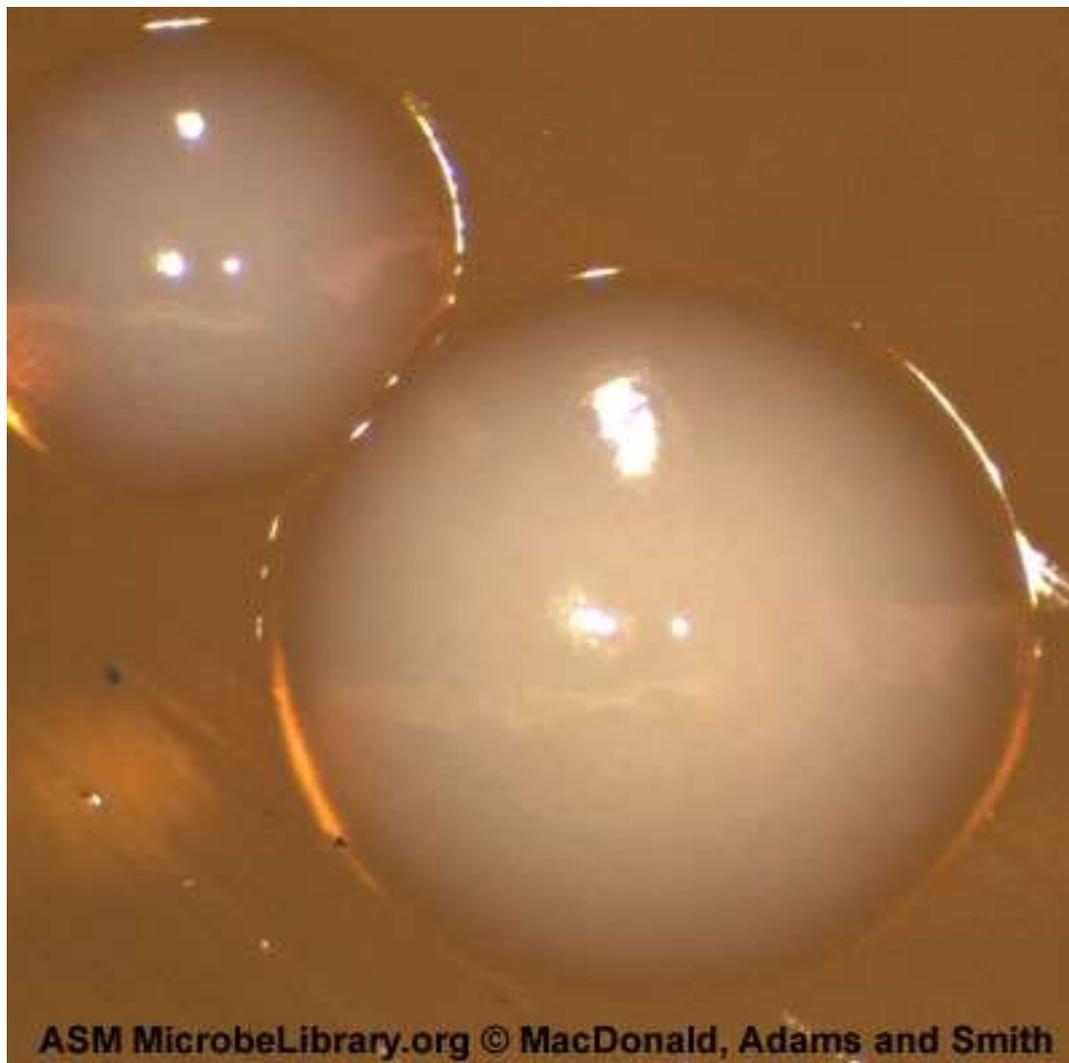
Streptomyces albus morphology (Enlarged view)FIG. 3. Circular form. Streptomyces albus cultivated on nutrient agar. Notice that the agar is depressed or pitted by the growth of the bacteria. The bacteria release exoenzymes that hydrolyze the agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



*Corynebacterium xerosis* morphology (Enlarged view) FIG. 4. Circular form, entire margin. *Corynebacterium xerosis* cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)

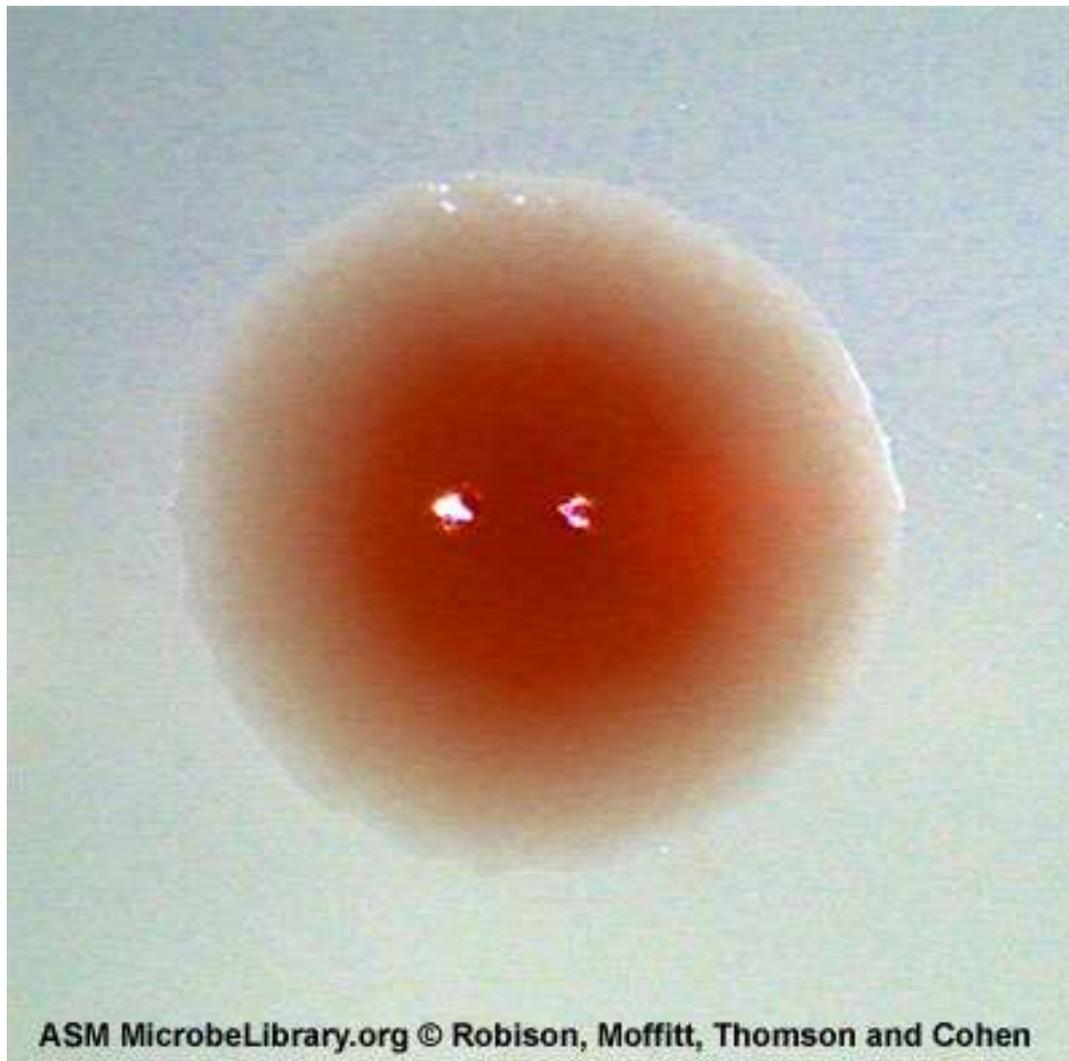


Sinorhizobium meliloti morphology (Enlarged view)FIG. 5. Circular form, entire margin. Sinorhizobium meliloti cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



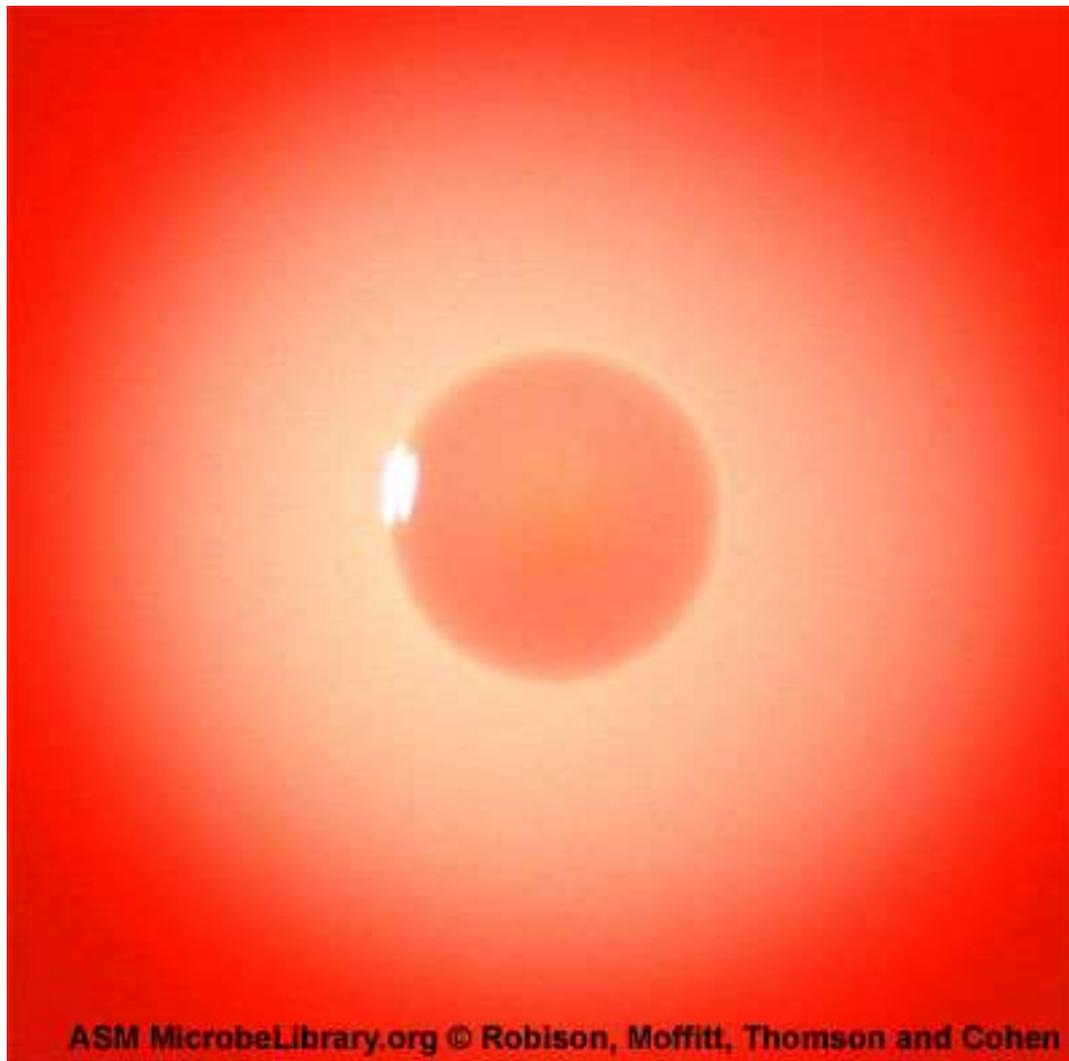
ASM MicrobeLibrary.org © MacDonald, Adams and Smith

Lactobacillus plantarum morphology (Enlarged view)FIG. 6. Circular form, entire margin. Lactobacillus plantarum cultivated on lactobacillus agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)

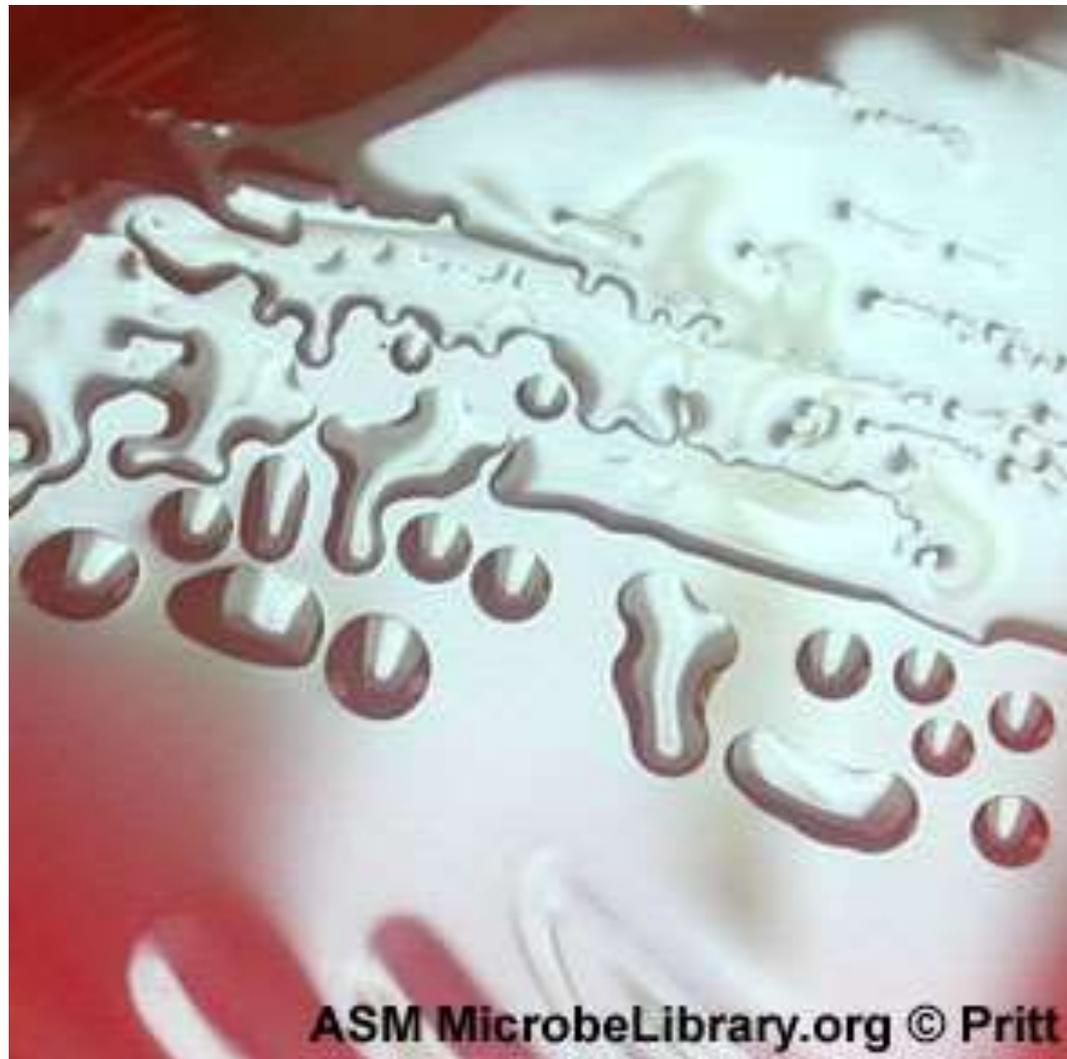


ASM MicrobeLibrary.org © Robison, Moffitt, Thomson and Cohen

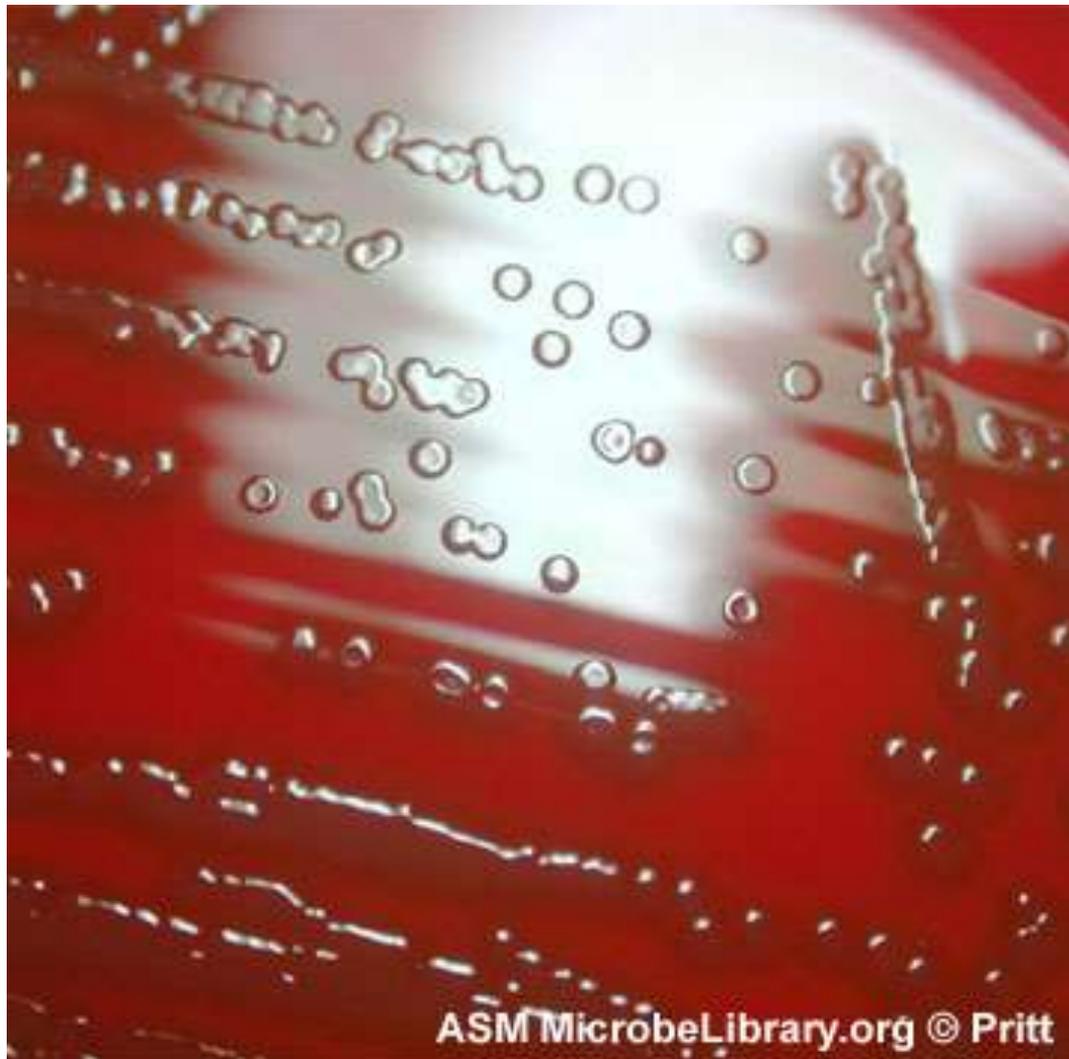
*Serratia marcescens* morphology (Enlarged view)FIG. 7. Circular form, entire margin. *Serratia marcescens* cultivated on Columbia agar. (Richard A. Robison, Gable Moffitt, Neal Thomson, and Marissa Cohen, Brigham Young University, Provo, UT)



Streptococcus pneumoniae morphology (Enlarged view)FIG. 8. Circular form, entire margin. Streptococcus pneumoniae cultivated on 5% sheep blood agar and showing beta-hemolysis. This is typical of *S. pneumoniae* grown anaerobically. (Richard A. Robison, Gable Moffitt, Neal Thomson, and Marissa Cohen, Brigham Young University, Provo, UT)



Streptococcus pneumoniae morphology (Enlarged view)FIG. 9. Circular form, entire margin. Mucoïd strain of Streptococcus pneumoniae cultivated on sheep blood agar. The mucoïd phenotype is due to the presence of a thick polysaccharide capsule. (Bobbi Pritt, Mayo Clinic, Rochester, MN)

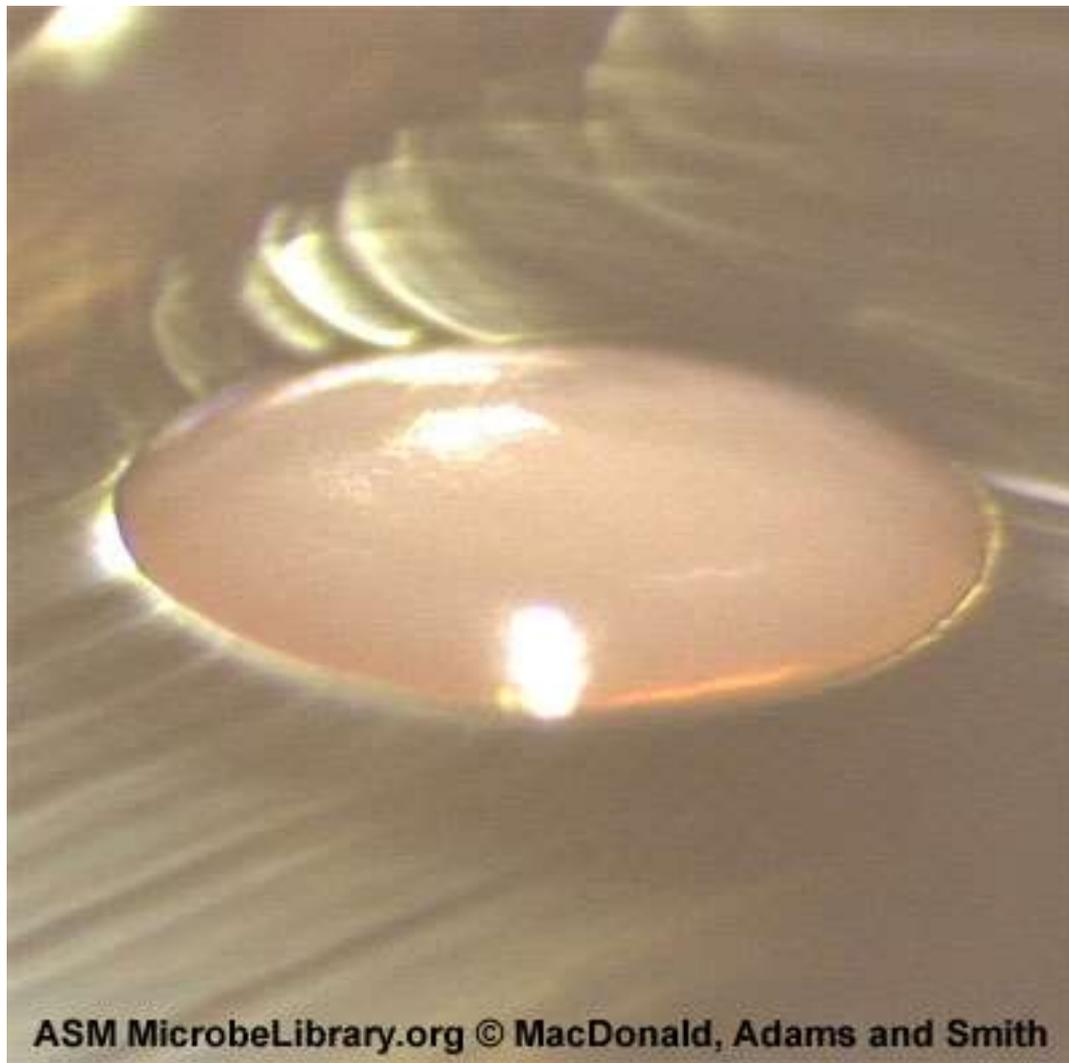


*Streptococcus pneumoniae* morphology (Enlarged view)

FIG. 10. Circular form, entire margin. Nonmuroid strain of *Streptococcus pneumoniae* cultivated on sheep blood agar. This phenotype classically presents as small, flat, 2- to 3-mm colonies with a concave or indented center. In comparison to the muroid phenotype, it contains an attenuated polysaccharide capsule. (Bobbi Pritt, Mayo Clinic, Rochester, MN)

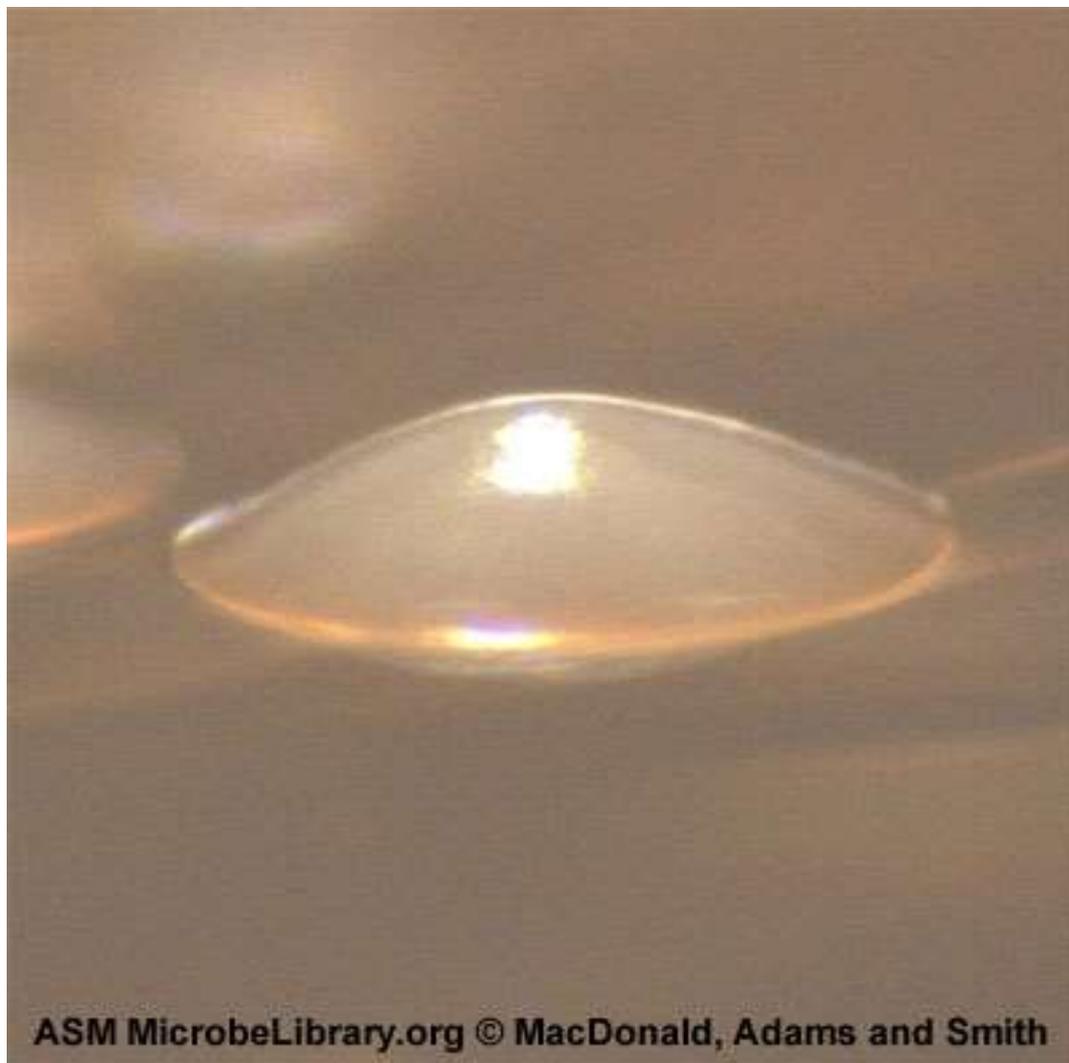


Unknown isolate morphology (Enlarged view)FIG. 11. Circular form, entire margin. Unknown isolates cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



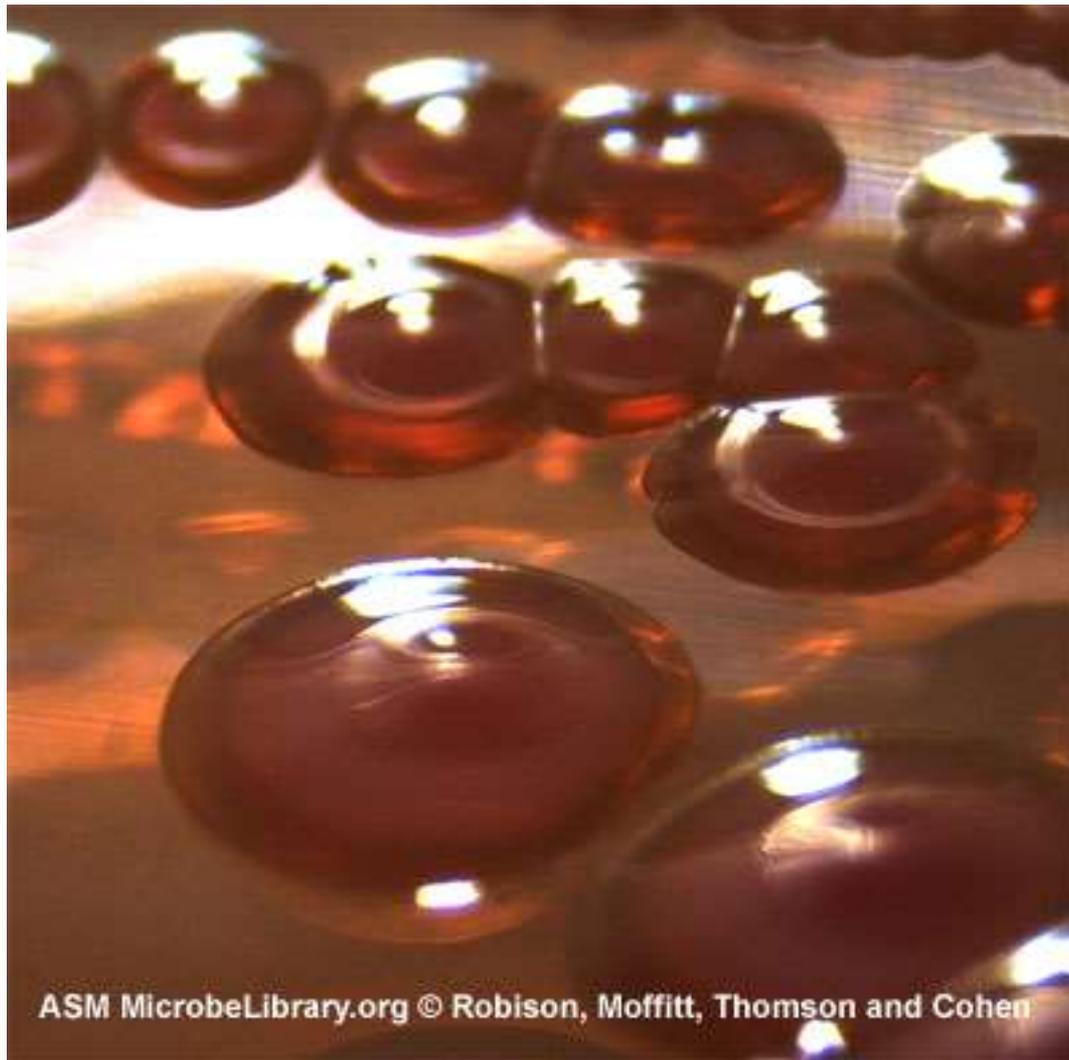
Unknown isolate morphology (Enlarged view)

FIG. 12. Circular form, convex elevation, entire margin. Unknown isolate cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



Unknown isolate morphology (Enlarged view)

FIG. 13. Circular form, convex elevation, entire margin. Unknown isolate cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)

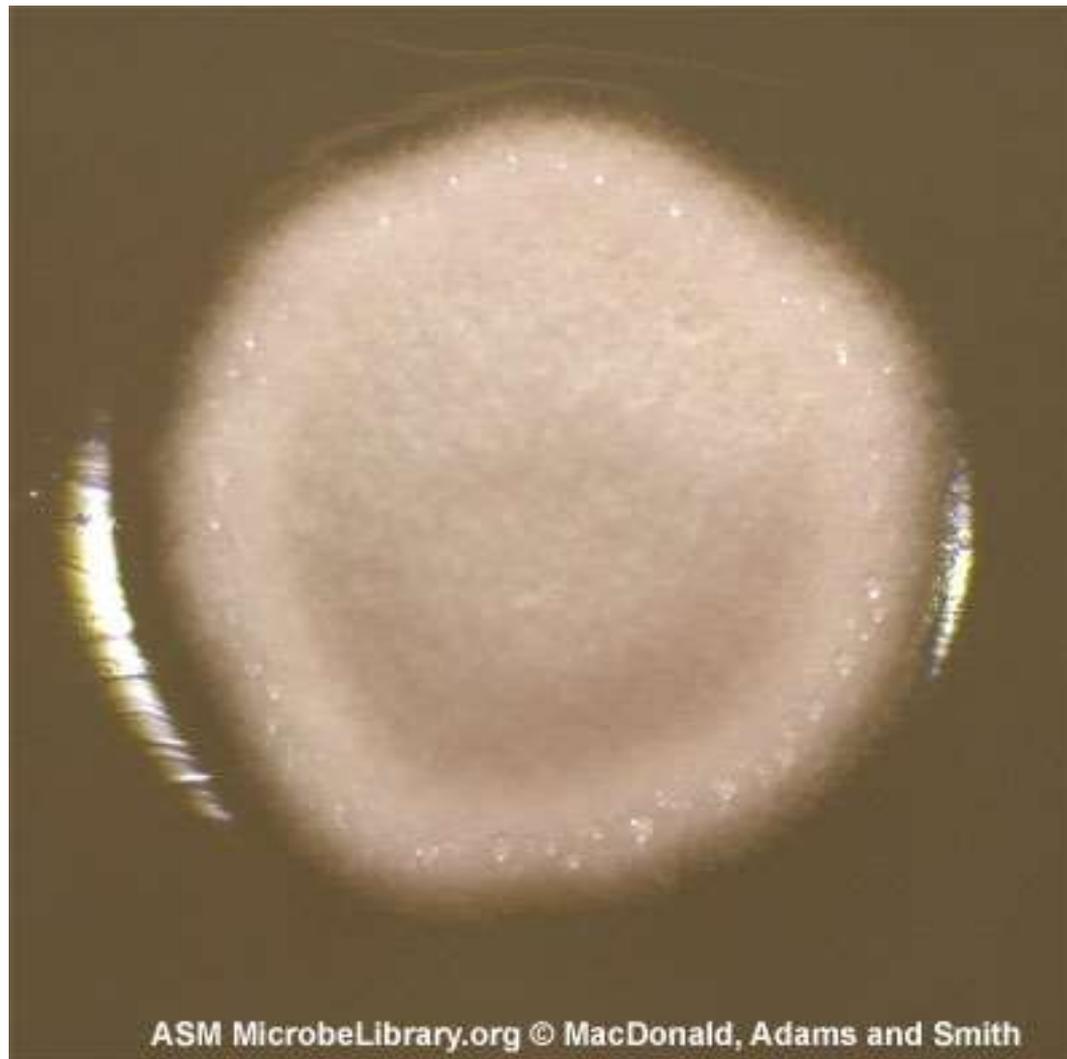


*Pasteurella multocida* morphology (Enlarged view) FIG. 14. Circular form, umbonate elevation. *Pasteurella multocida* cultivated on 5% sheep blood agar. (Richard A. Robison, Gable Moffitt, Neal Thomson, and Marissa Cohen, Brigham Young University, Provo, UT)



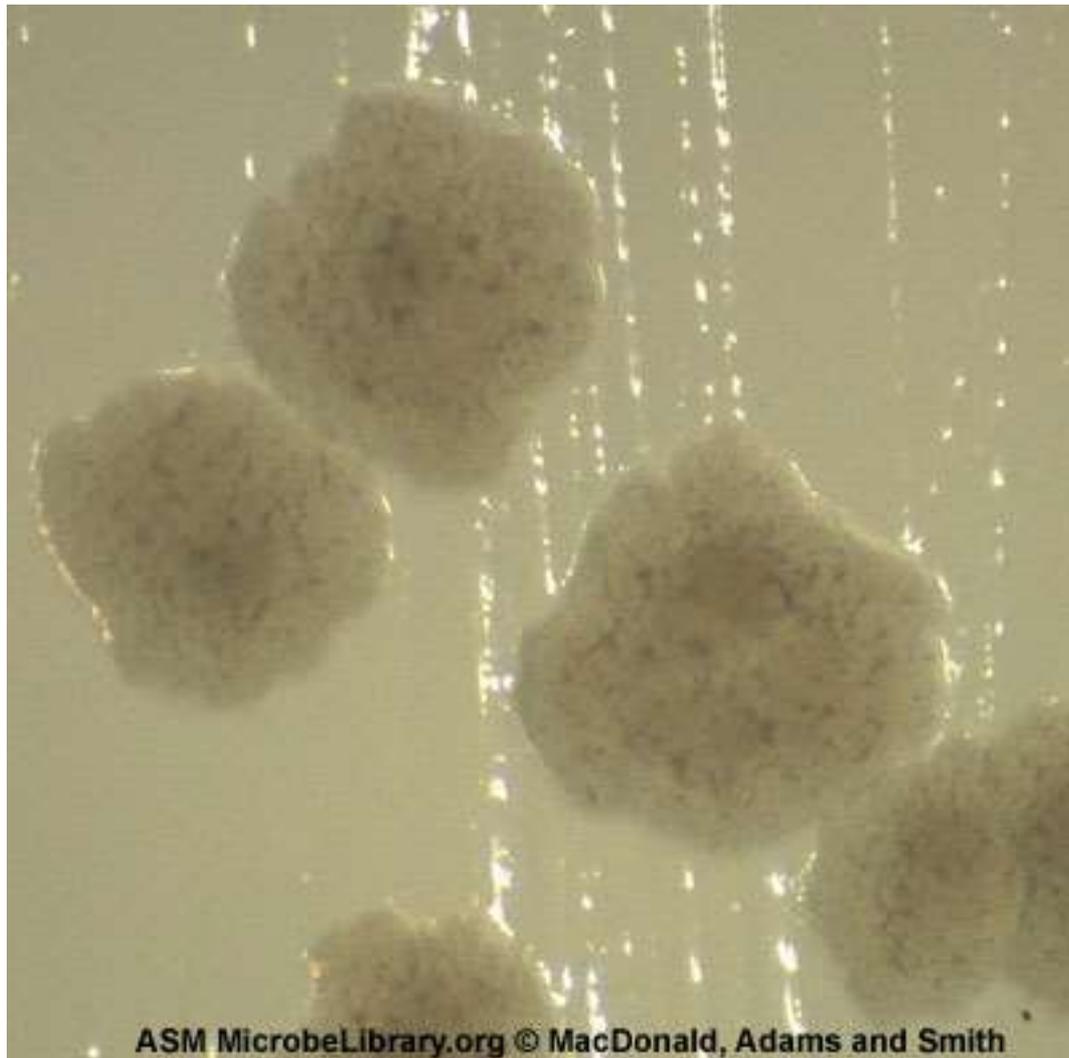
*Nocardia asteroides* morphology (Enlarged view)

FIG. 15. Filamentous form. *Nocardia asteroides* cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



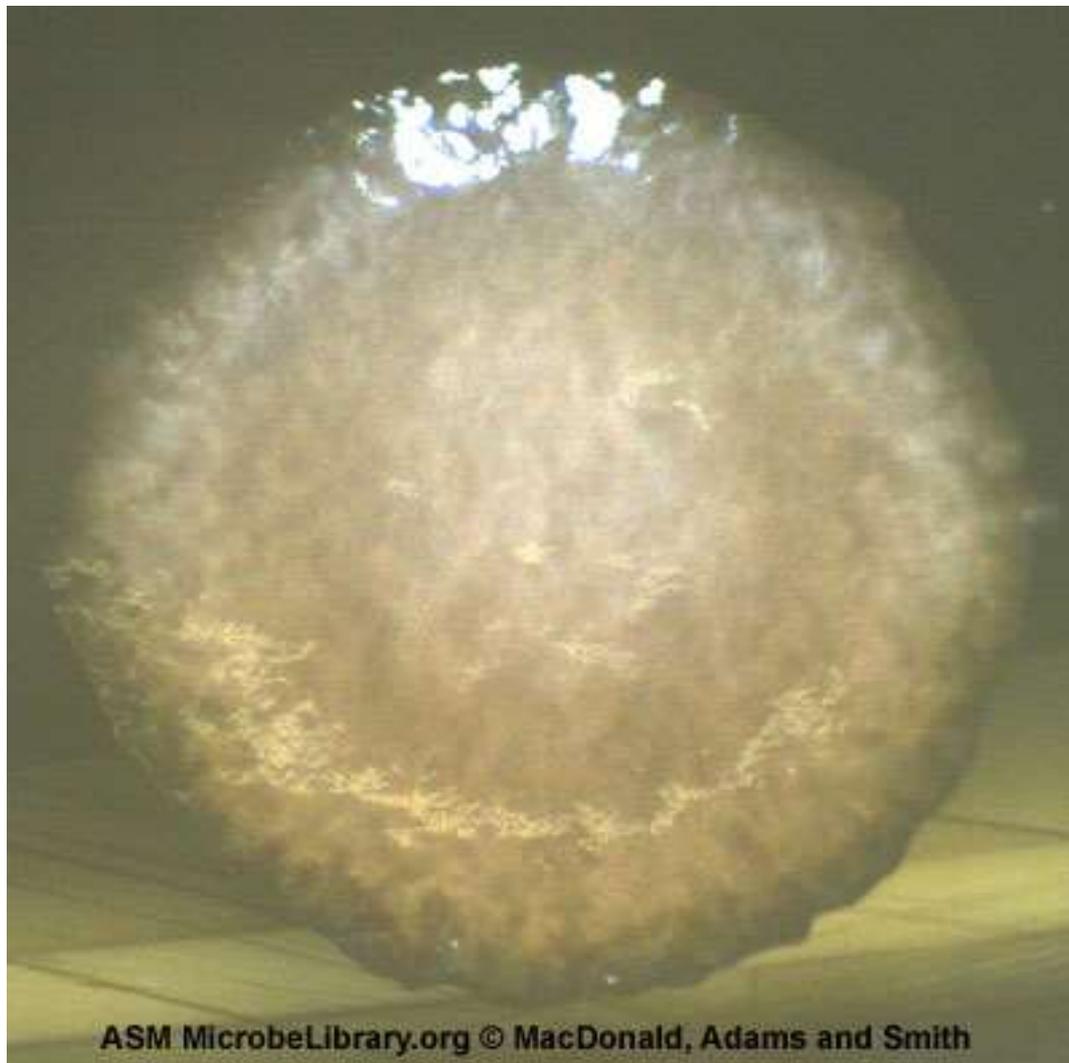
*Streptomyces albus* morphology (Enlarged view)

FIG. 16. Filamentous form, weakly undulate margin. *Streptomyces albus* cultivated on nutrient agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



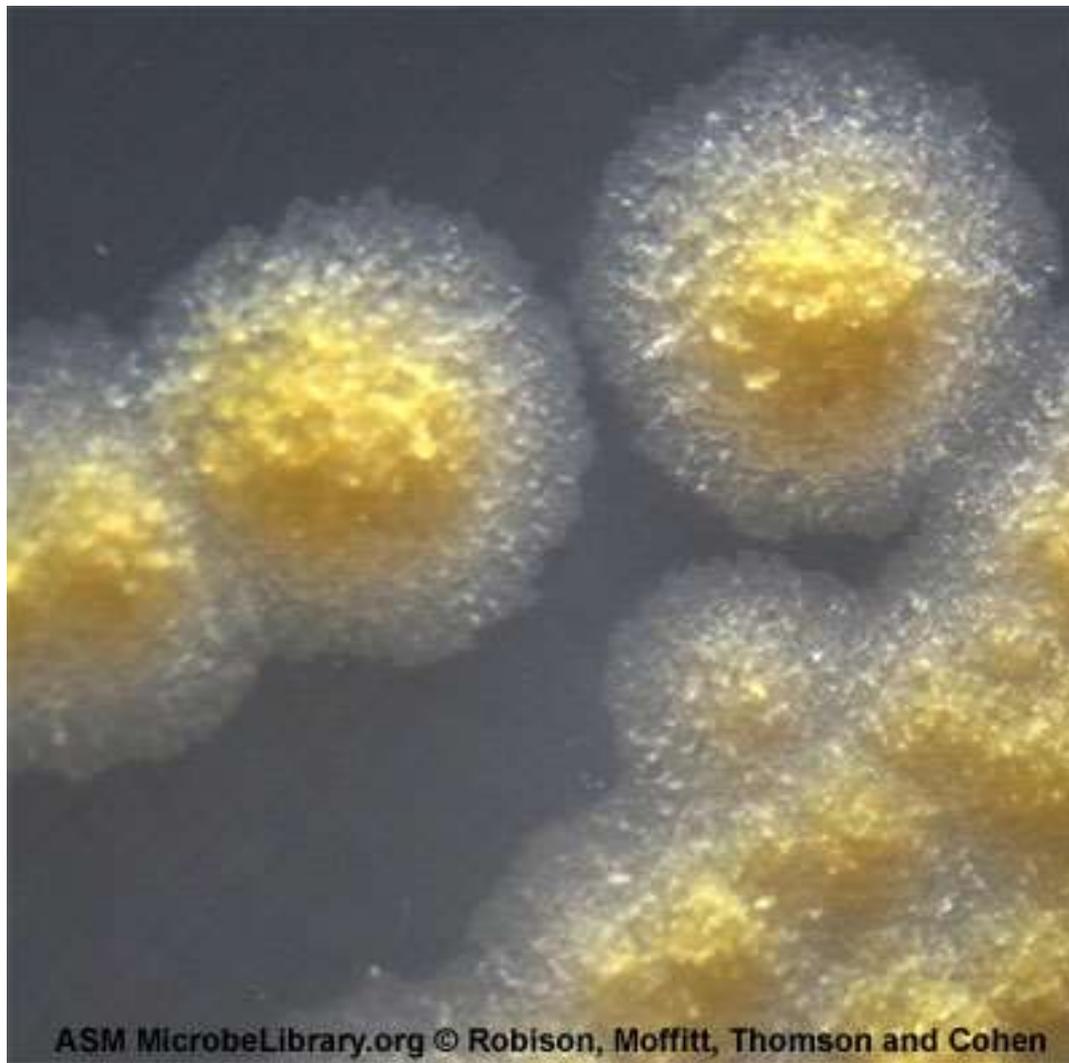
*Mycobacterium smegmatis* morphology (Enlarged view)

FIG. 17. Irregular form. *Mycobacterium smegmatis* cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



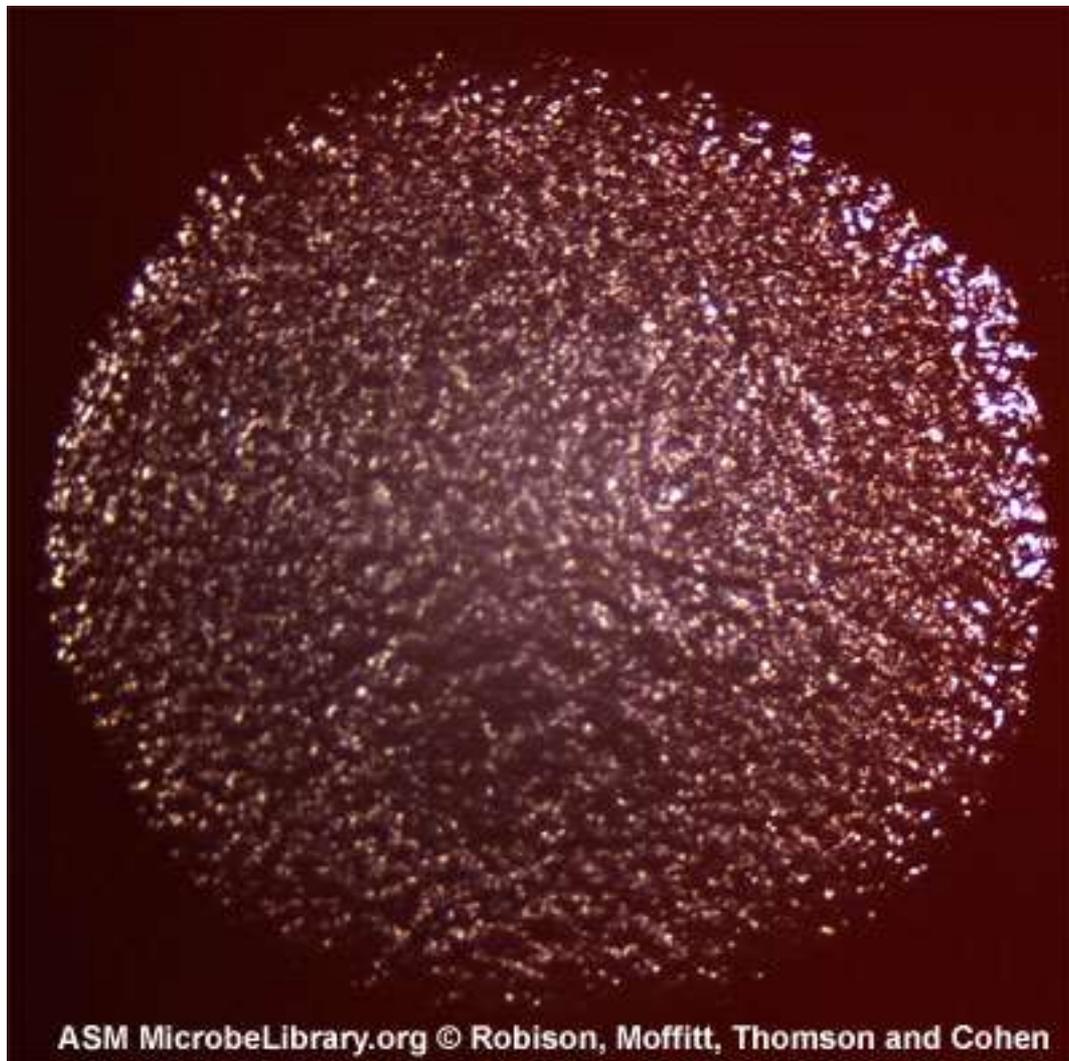
ASM MicrobeLibrary.org © MacDonald, Adams and Smith

Kurthia morphology (Enlarged view)FIG. 18. Weakly irregular form. Kurthia sp. cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



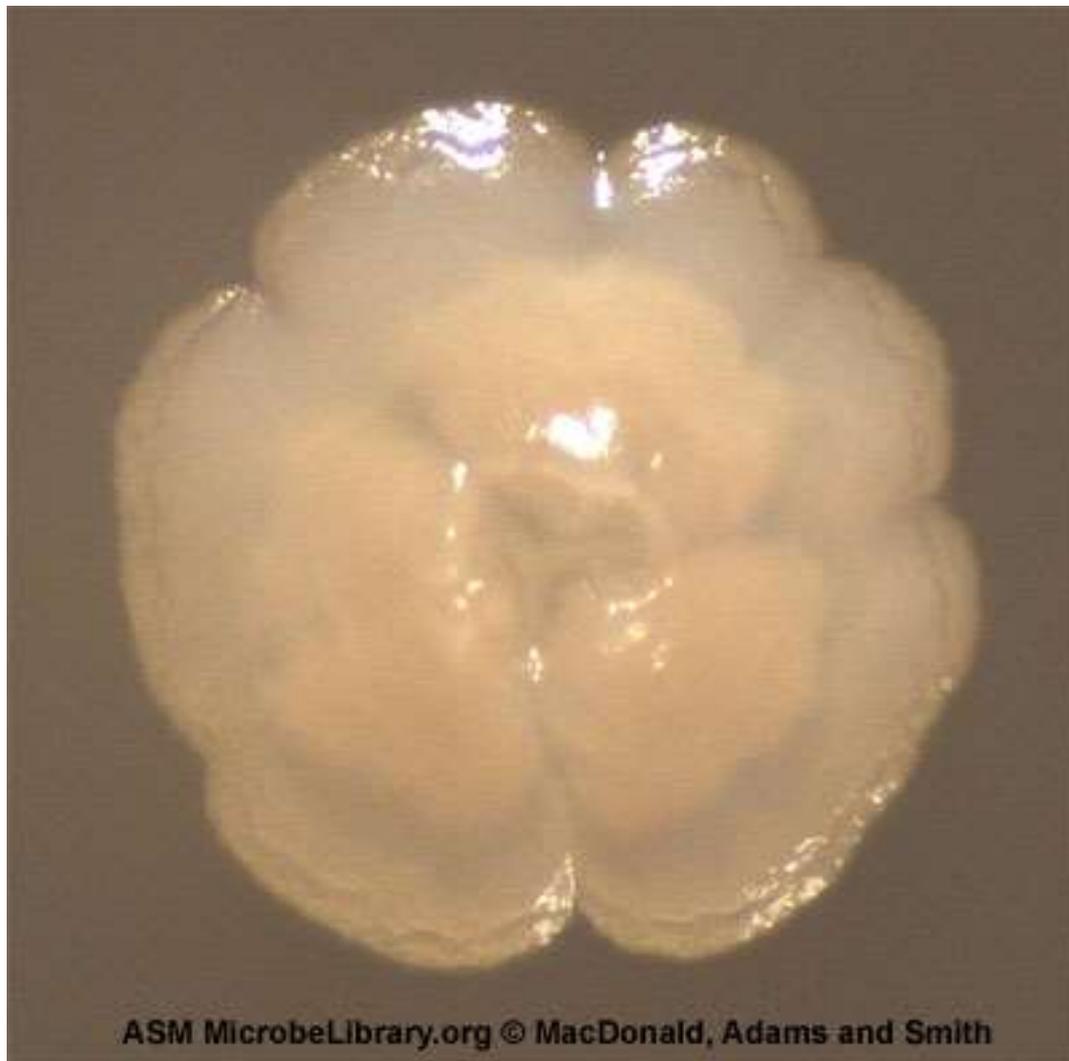
*Mycobacterium marinum* morphology (Enlarged view)

FIG. 19. Irregular form. *Mycobacterium marinum* cultivated on *Mycobacterium* 7H11 agar with oleic acid-albumin-dextrose-catalase enrichment. (Richard A. Robison, Gable Moffitt, Neal Thomson, and Marissa Cohen, Brigham Young University, Provo, UT)



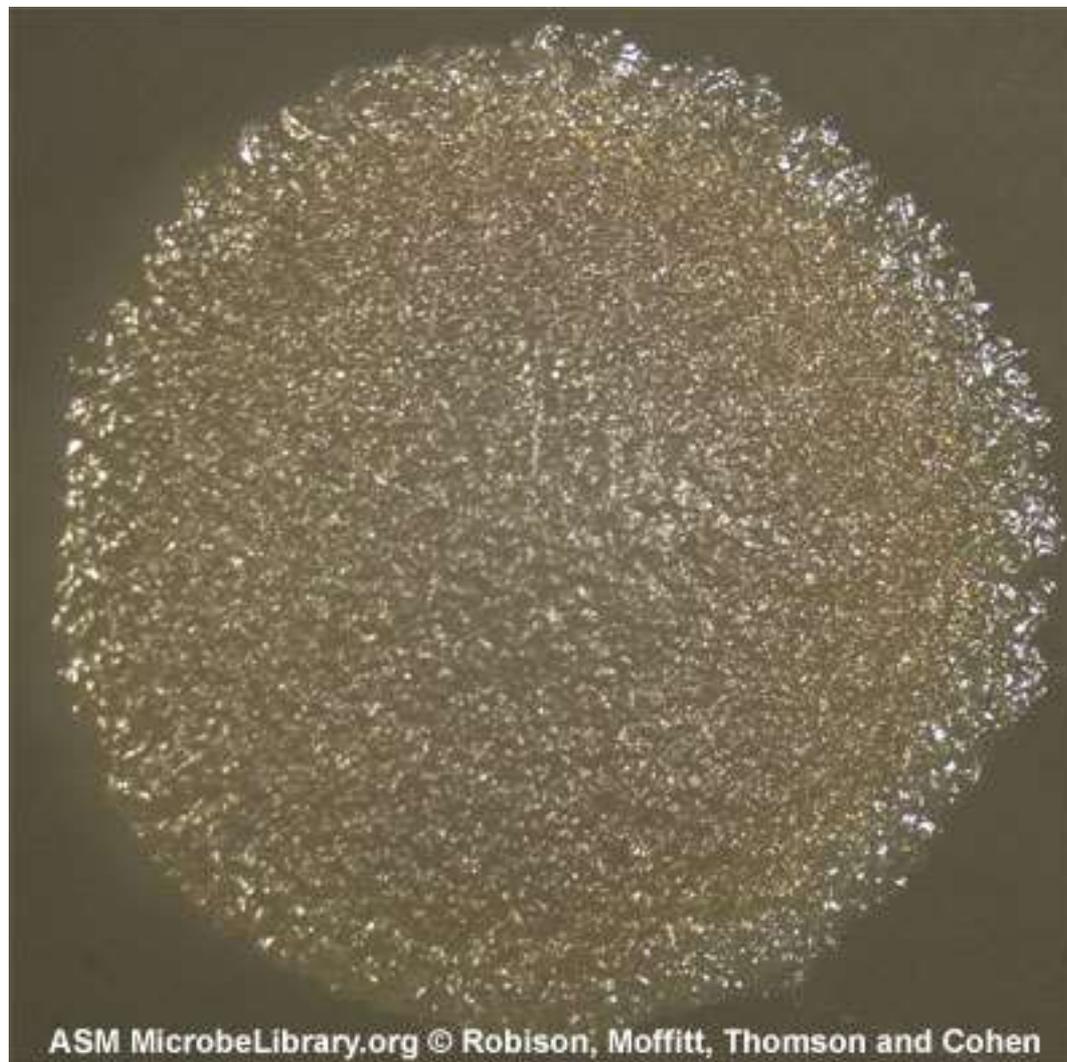
*Bacillus thuringiensis* morphology (Enlarged view)

FIG. 20. Weakly irregular form. *Bacillus thuringiensis* cultivated on 5% sheep blood agar. (Richard A. Robison, Gable Moffitt, Neal Thomson, and Marissa Cohen, Brigham Young University, Provo, UT)



Unknown isolate morphology (Enlarged view)

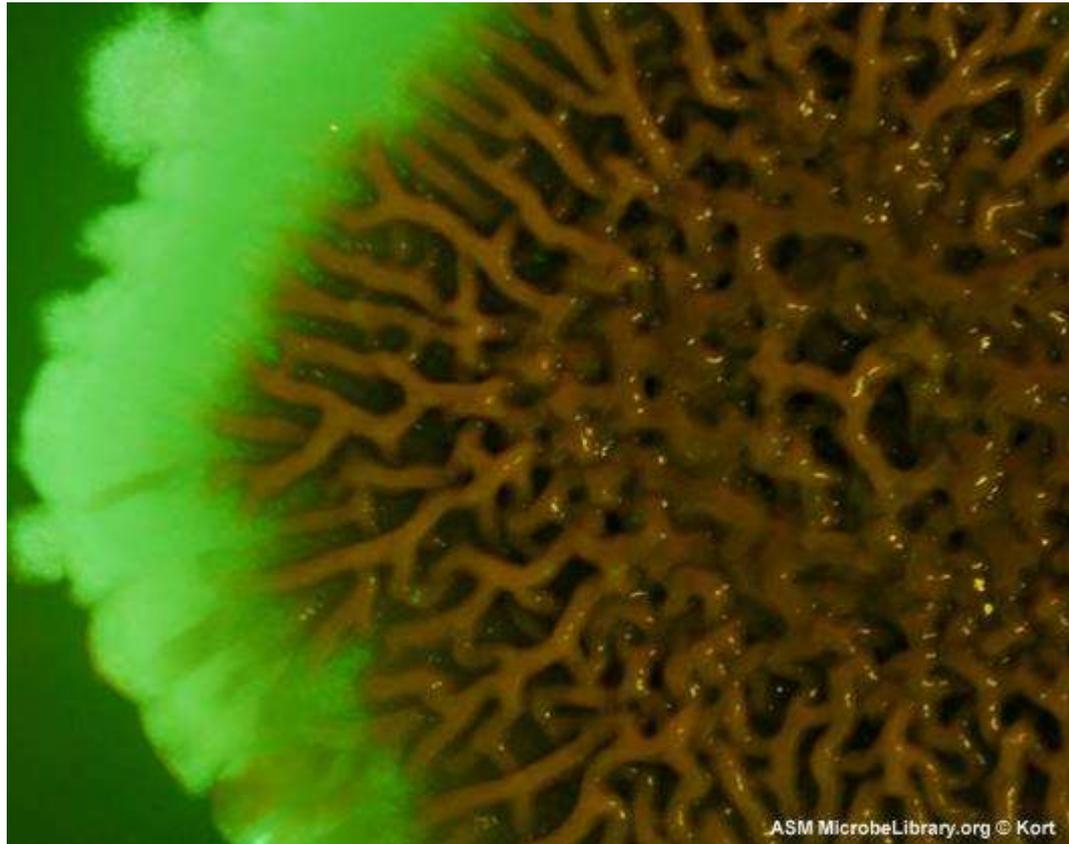
FIG. 21. Irregular form, undulate margin. Unknown isolate cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



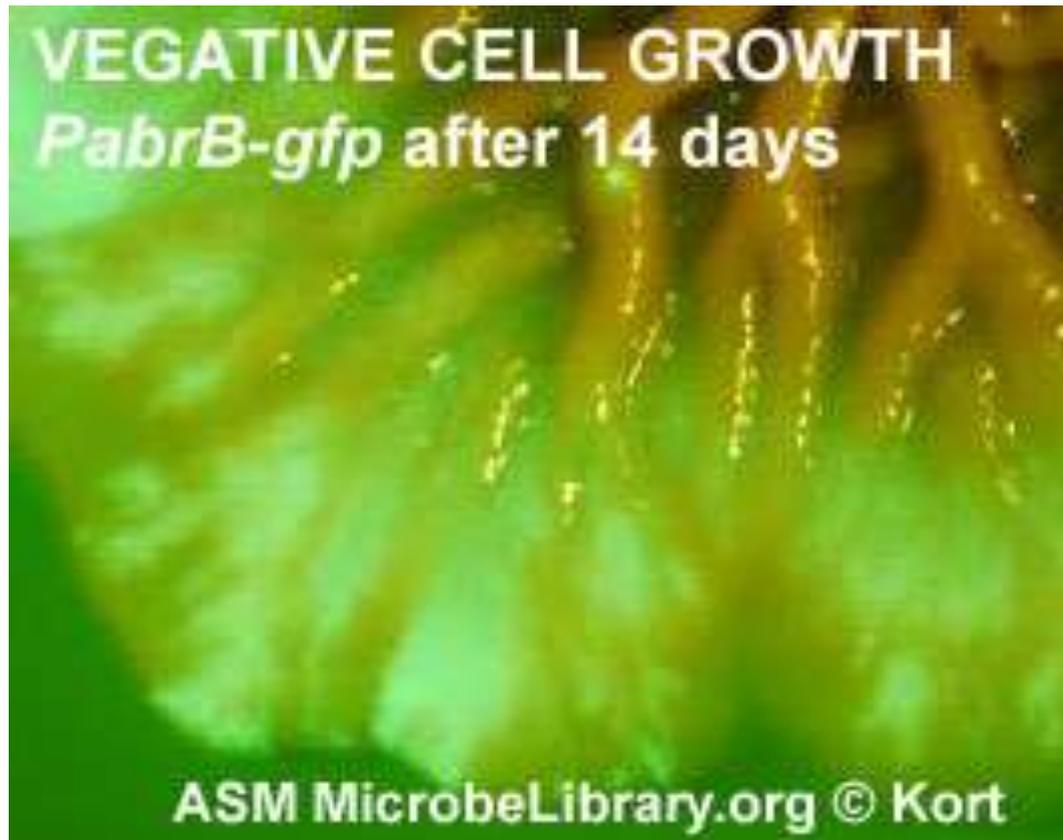
Bacillus anthracis morphology (Enlarged view)FIG. 22. Irregular form, weakly undulate margin. Bacillus anthracis Sterne 1043 cultivated on Columbia agar. Notice the typical ground glass appearance. (Richard A. Robison, Gable Moffitt, Neal Thomson, and Marissa Cohen, Brigham Young University, Provo, UT)



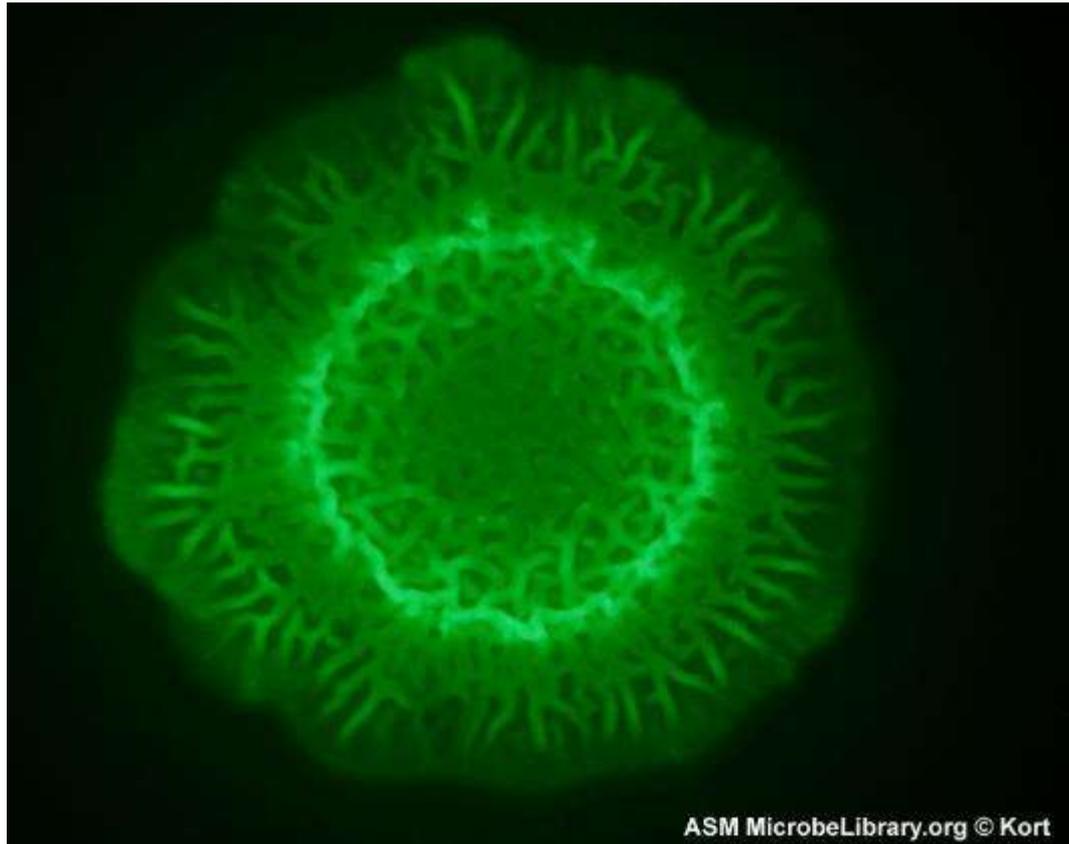
Streptomyces albus morphology (Enlarged view)FIG. 23. Irregular form, undulate margin. 10-day culture of Streptomyces albus cultivated on nutrient agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



Bacillus subtilis morphology (Enlarged view)FIG. 24. Irregular form, undulate margin. Bacillus subtilis PabrB-gfp viewed at low magnification. (Remco Kort, TNO, Netherlands)



Bacillus subtilis morphology (Enlarged view)FIG. 25. Irregular form, undulate margin. Bacillus subtilis PabrB-gfp after 14 days viewed at high magnification. (Remco Kort, TNO, Netherlands)



Bacillus subtilis morphology (Enlarged view)FIG. 26. Irregular form, undulate margin. Bacillus subtilis PspollA-gfp viewed at low magnification. (Remco Kort, TNO, Netherlands)



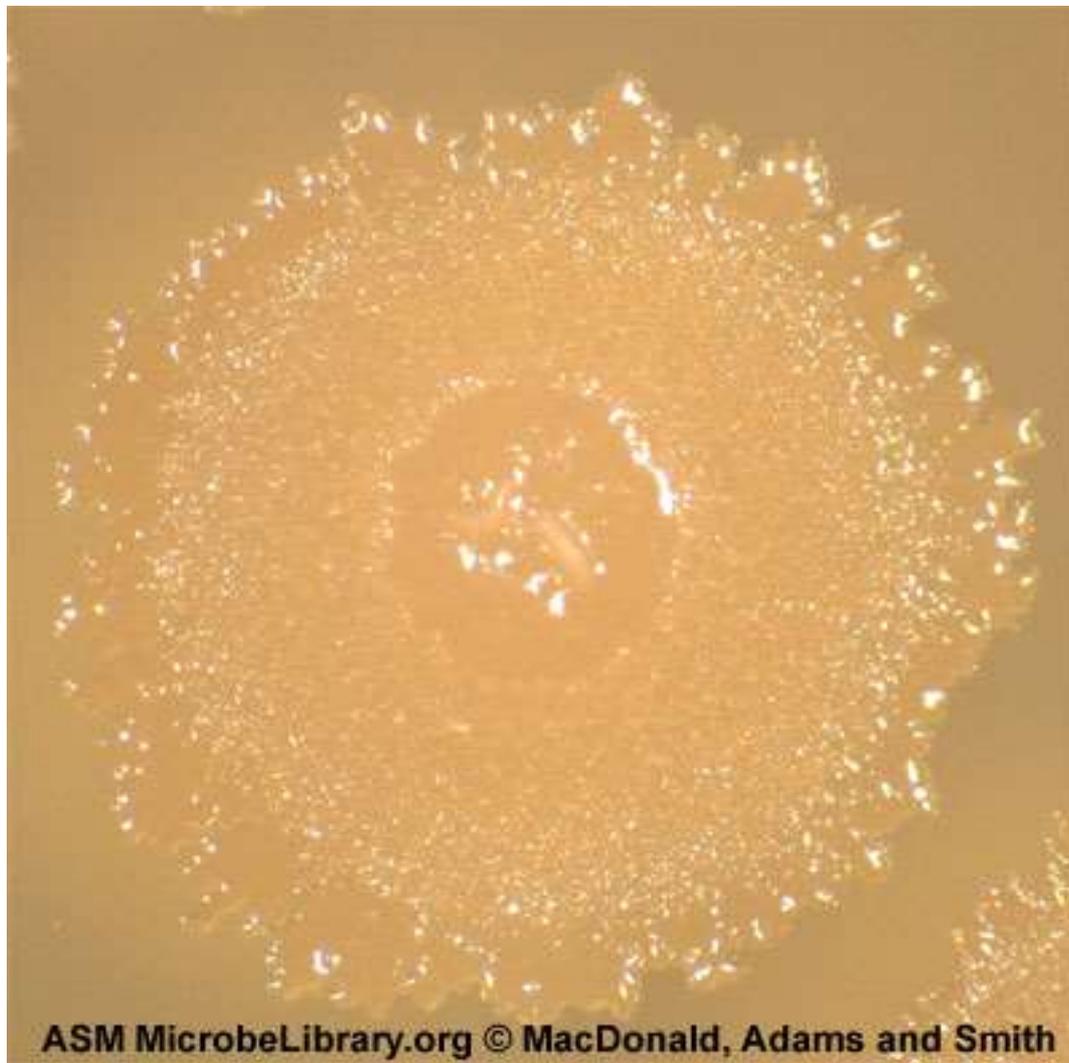
Bacillus subtilis morphology (Enlarged view)FIG. 27. Irregular form, undulate margin. Bacillus subtilis PspollA-gfp viewed at low magnification. (Remco Kort, TNO, Netherlands)



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Unknown isolate morphology (Enlarged view)

FIG. 28. Irregular form, lobate margin. Unknown isolate cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)

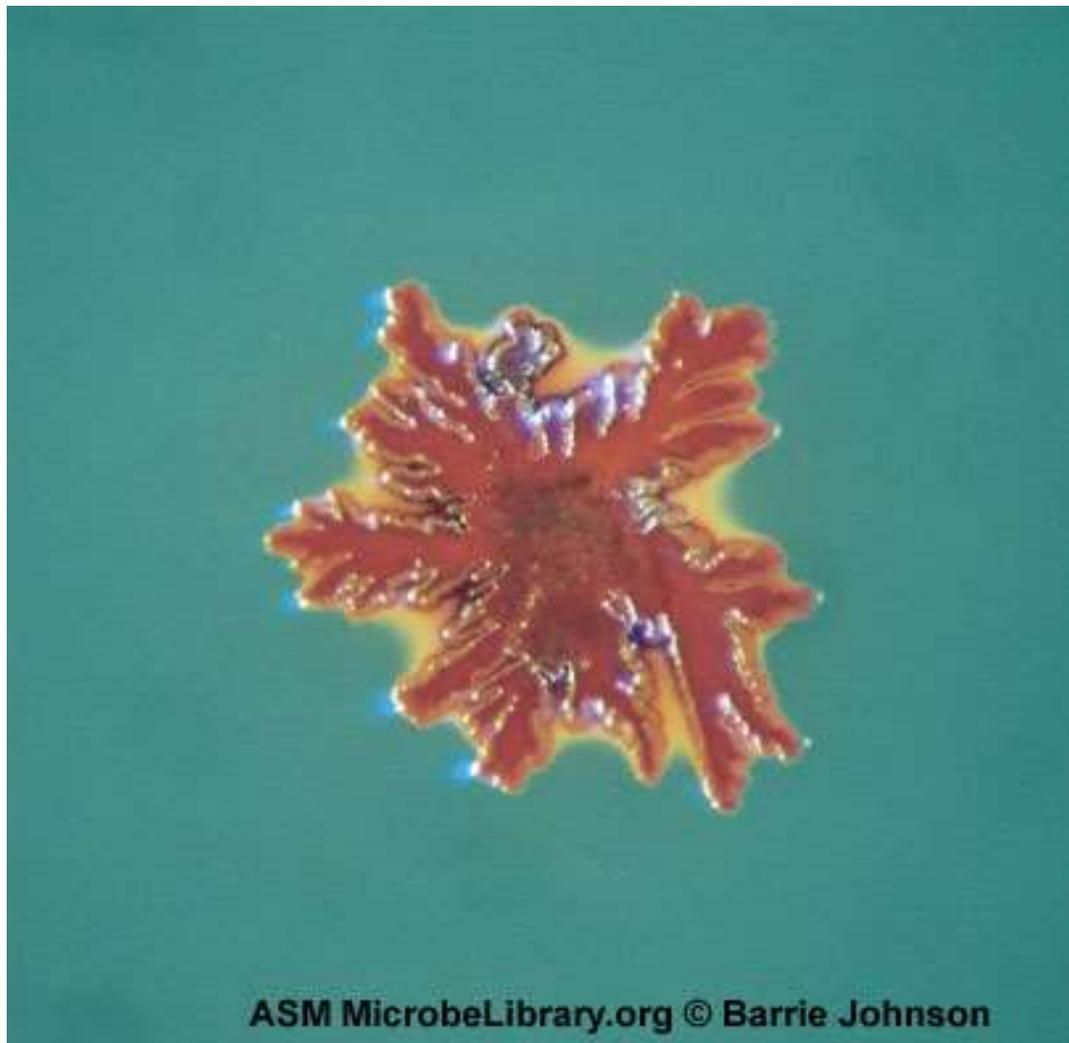


Unknown isolate morphology (Enlarged view)

FIG. 29. Irregular form, lobate margin. Unknown isolate cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



*Bacillus licheniformis* morphology (Enlarged view) FIG. 30. Irregular form, lobate margin. Two colonies of *Bacillus licheniformis* cultivated on 5% sheep blood agar. (Richard A. Robison, Gable Moffitt, Neal Thomson, and Marissa Cohen, Brigham Young University, Provo, UT)



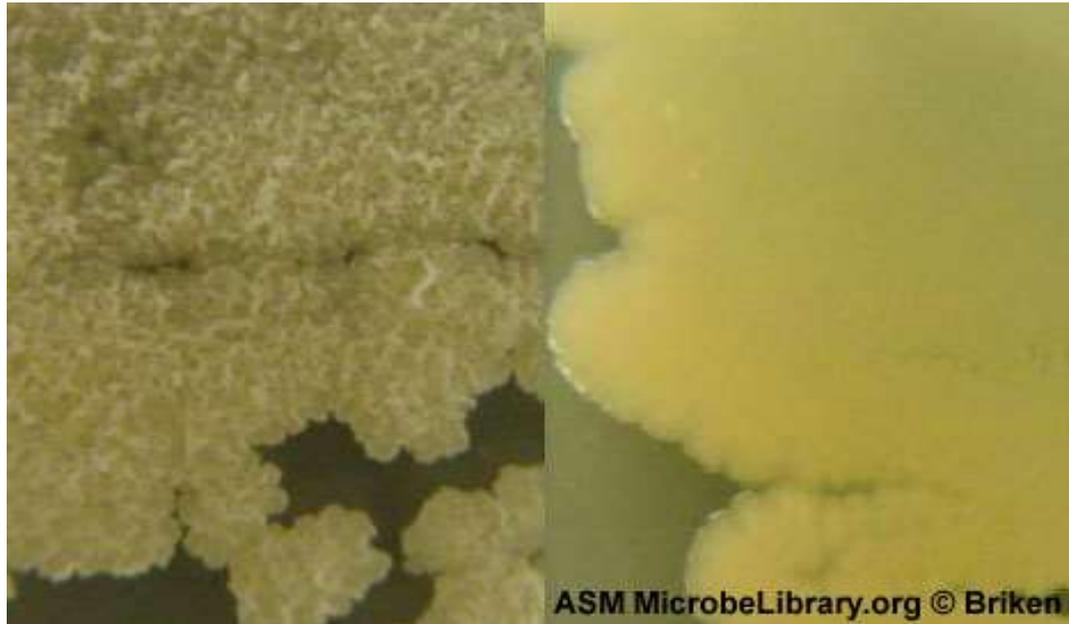
Thiomonas-like bacteria morphology (Enlarged view)

FIG. 31. Irregular form, lobate margin. Iron-oxidizing Thiomonas-like bacteria isolated from mine waters. (D. Barrie Johnson, University of Wales, UK)



Thiomonas-like bacteria morphology (Enlarged view)

FIG. 32. Irregular form, lobate margin. Iron-oxidizing Thiomonas-like bacteria isolated from mine waters. (D. Barrie Johnson, University of Wales, UK)



*Mycobacterium smegmatis* morphology (Enlarged view) FIG. 33. Irregular form, lobate margin. Rough colony morphology of wild-type *Mycobacterium smegmatis* (left side); the mutant phenotype (right side) is smooth and translucent when observed in front of direct light. (Volker Briken, University of Maryland, College Park, MD)

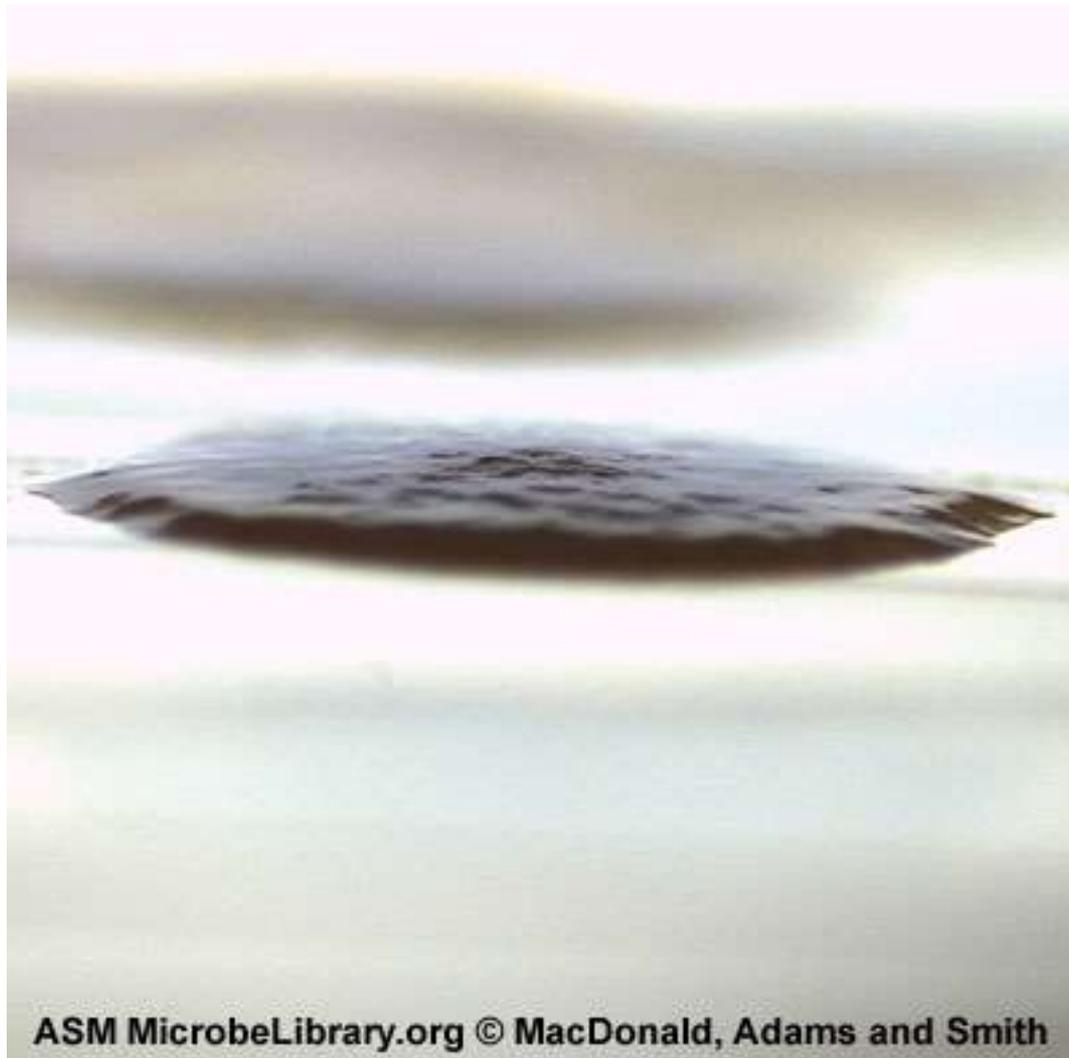


Unknown isolate morphology (Enlarged view)

FIG. 34. Part of colony demonstrating irregular form, lobate margin. Unknown isolate cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)

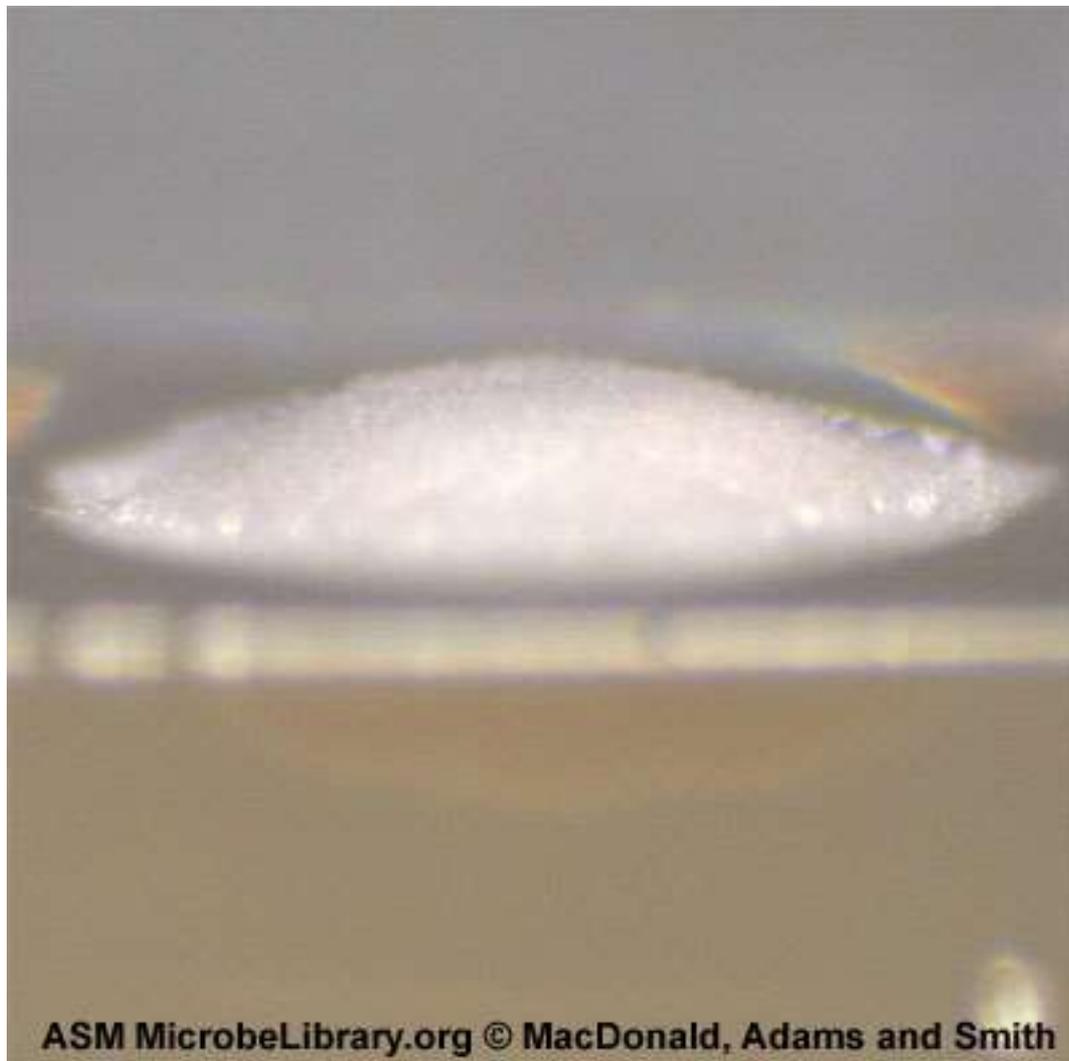


*Nocardia asteroides* morphology (Enlarged view)FIG. 35. Rhizoid form. Mature colonies of *Nocardia asteroides* cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)

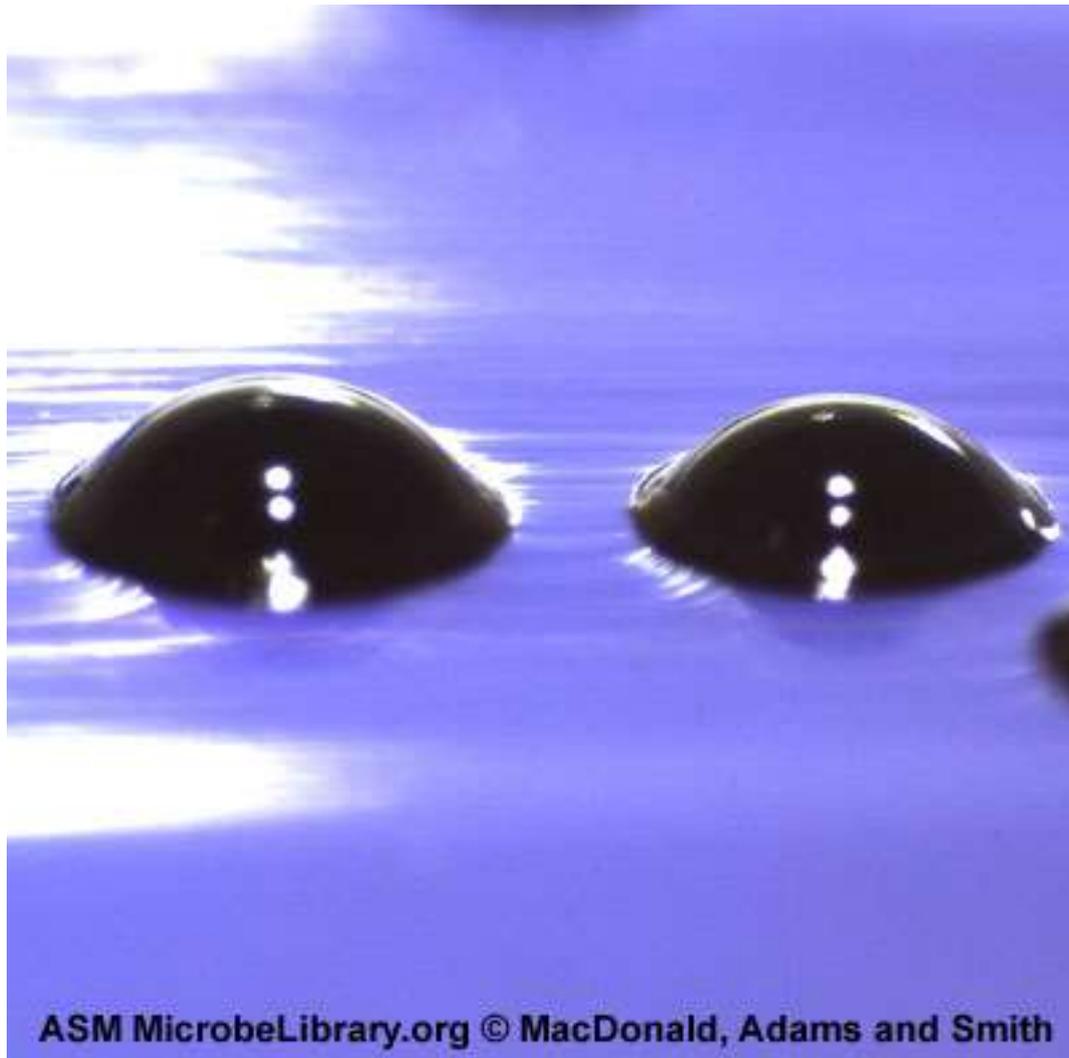


*Pseudomonas aeruginosa* morphology (Enlarged view)

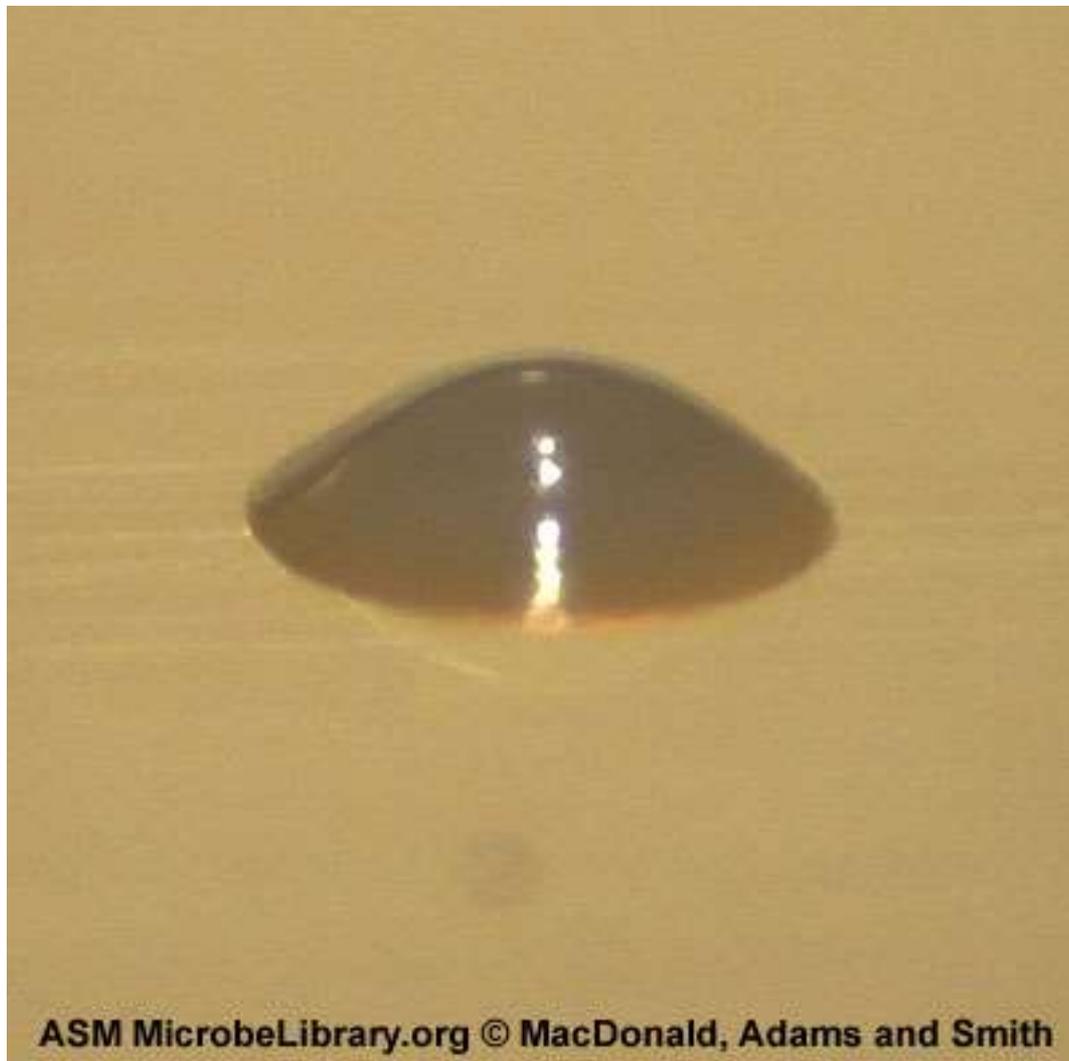
FIG. 36. Flat elevation. *Pseudomonas aeruginosa* cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



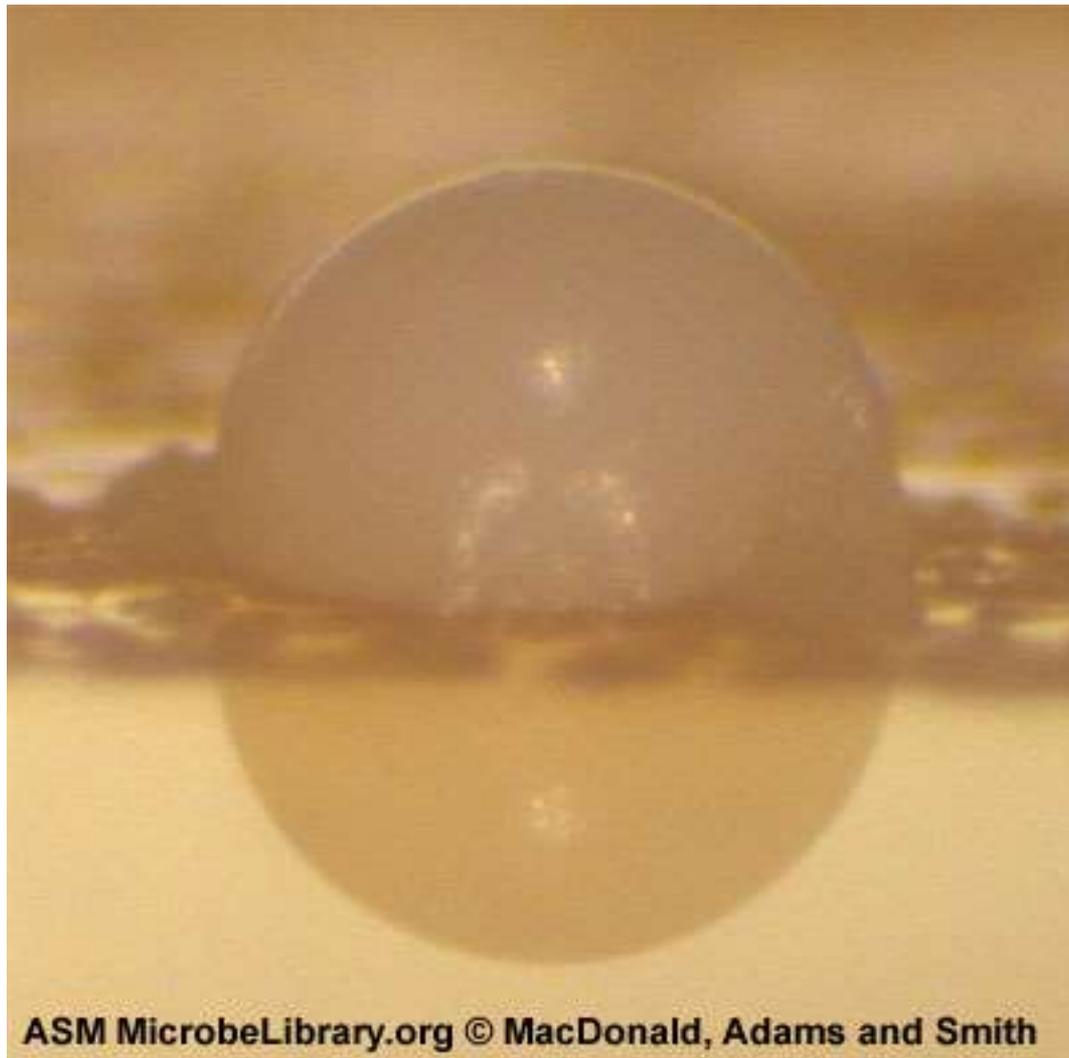
Streptomyces albus morphology (Enlarged view)FIG. 37. Convex elevation. Streptomyces albus cultivated on nutrient agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



*Streptococcus salivarius* morphology (Enlarged view) FIG. 38. Pulvinate elevation. *Streptococcus salivarius* cultivated on Mitis-salivarius agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



*Lactobacillus plantarum* morphology (Enlarged view)FIG. 39. Pulvinate elevation. *Lactobacillus plantarum* cultivated on lactobacillus agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)

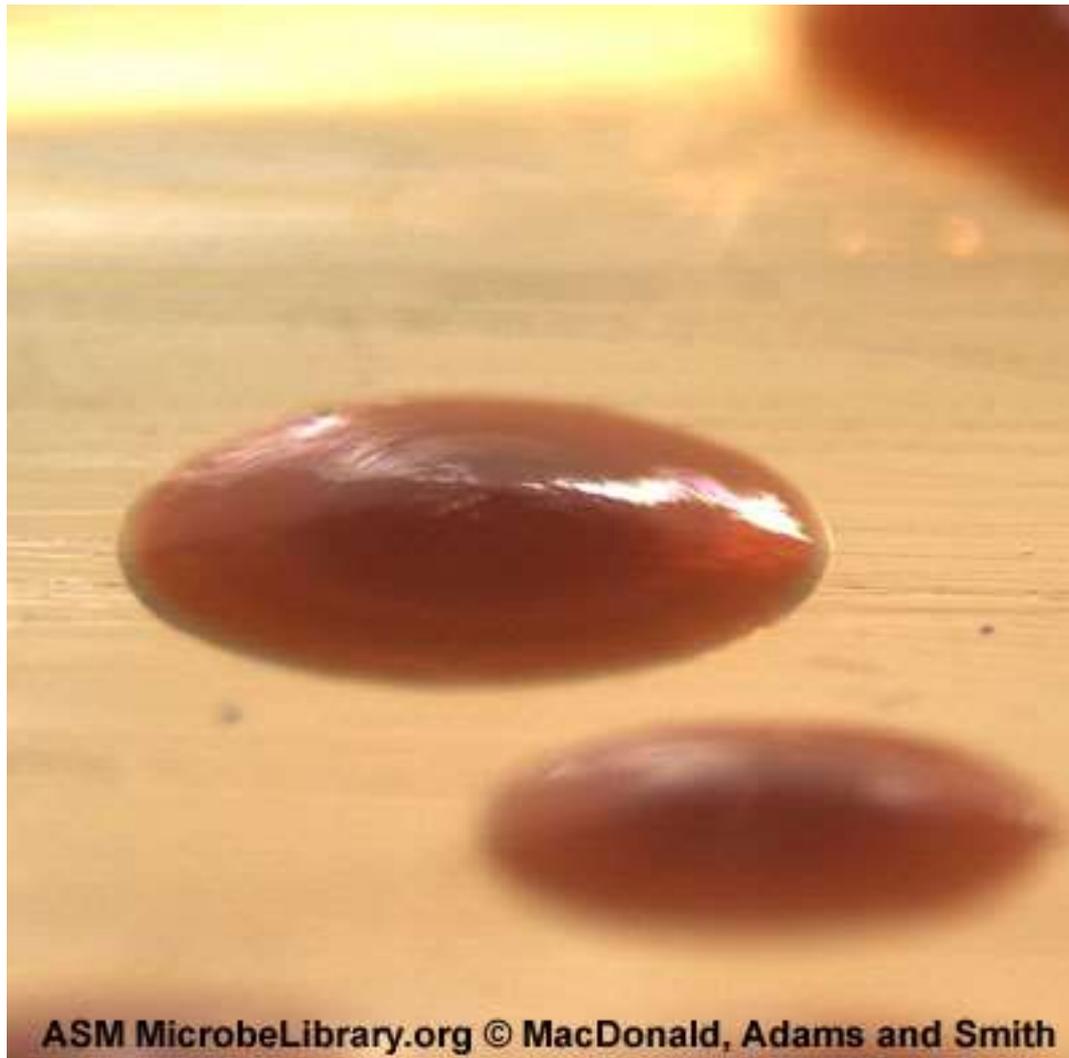


Unknown isolate morphology (Enlarged view) FIG. 40. Pulvinate elevation. Unknown isolate cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)

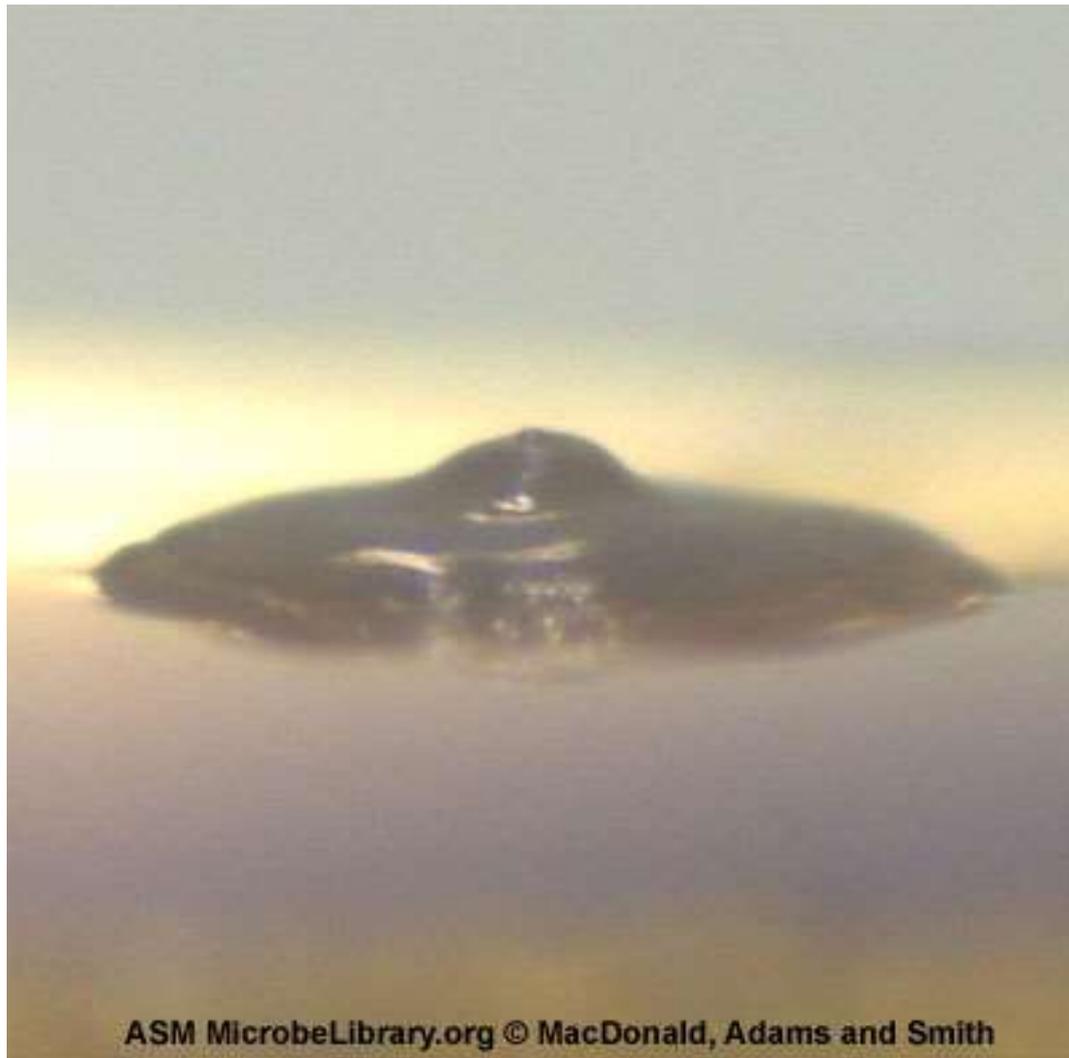


Kurthia morphology (Enlarged view)

FIG. 41. Weakly umbonate elevation. *Kurthia* sp. cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)

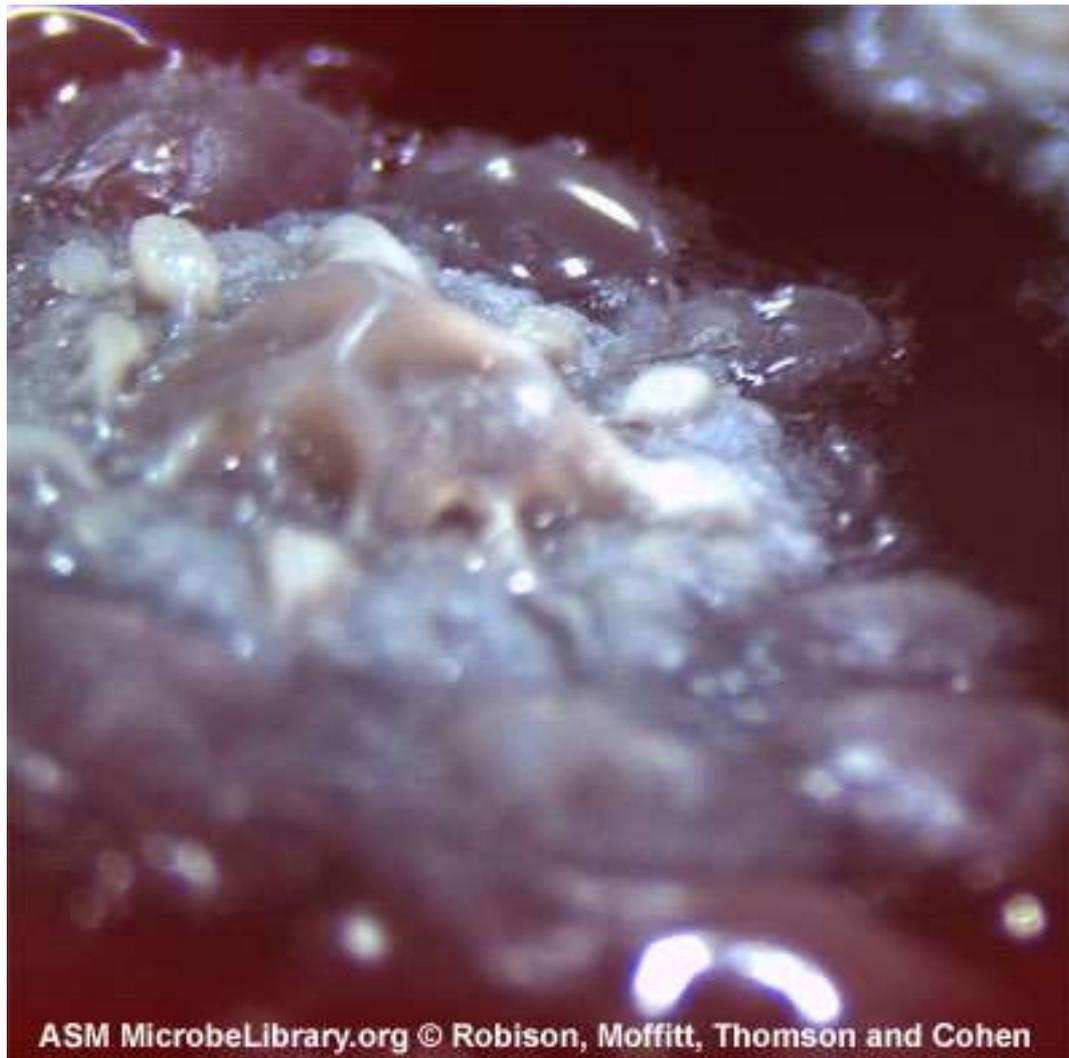


*Serratia marcescens* morphology (Enlarged view) FIG. 42. Weakly umbonate elevation. *Serratia marcescens* cultivated on trypticase soy agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)

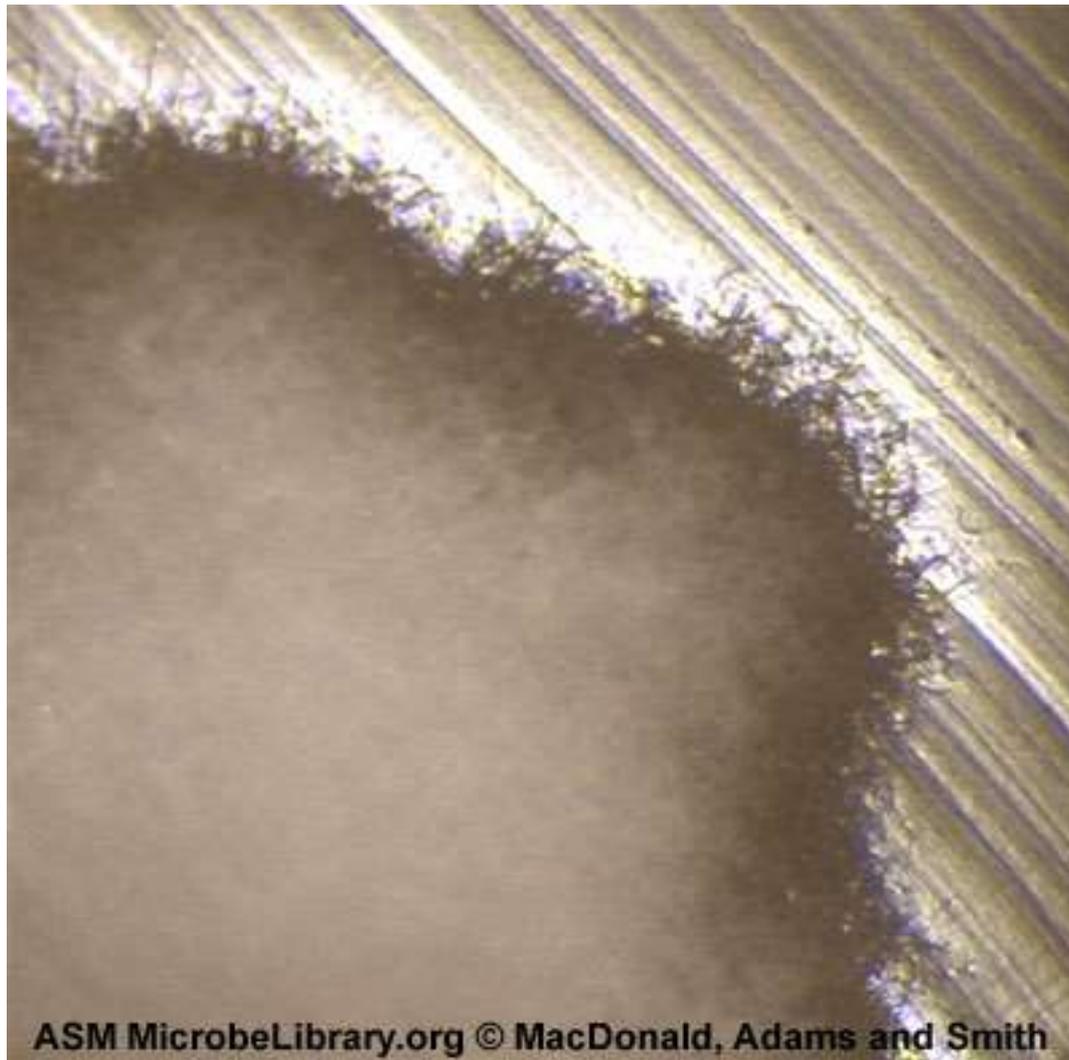


Unknown isolate morphology (Enlarged view)

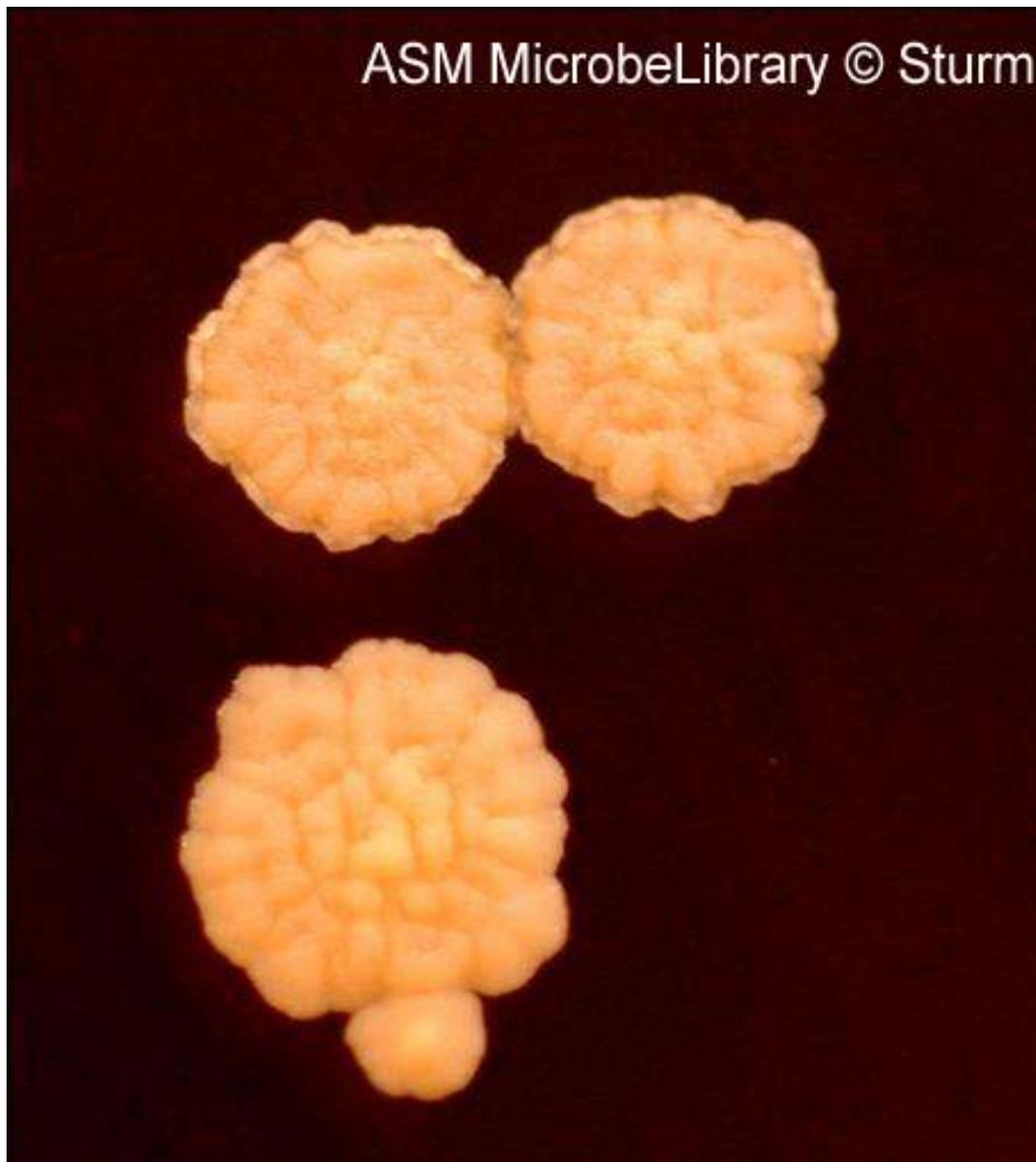
FIG. 43. Umbonate elevation. Unknown isolate cultivated on nutrient agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



Bacillus licheniformis morphology (Enlarged view)FIG. 44. Umbonate elevation. Bacillus licheniformis cultivated on 5% sheep blood agar. (Richard A. Robison, Gable Moffitt, Neal Thomson, and Marissa Cohen, Brigham Young University, Provo, UT)

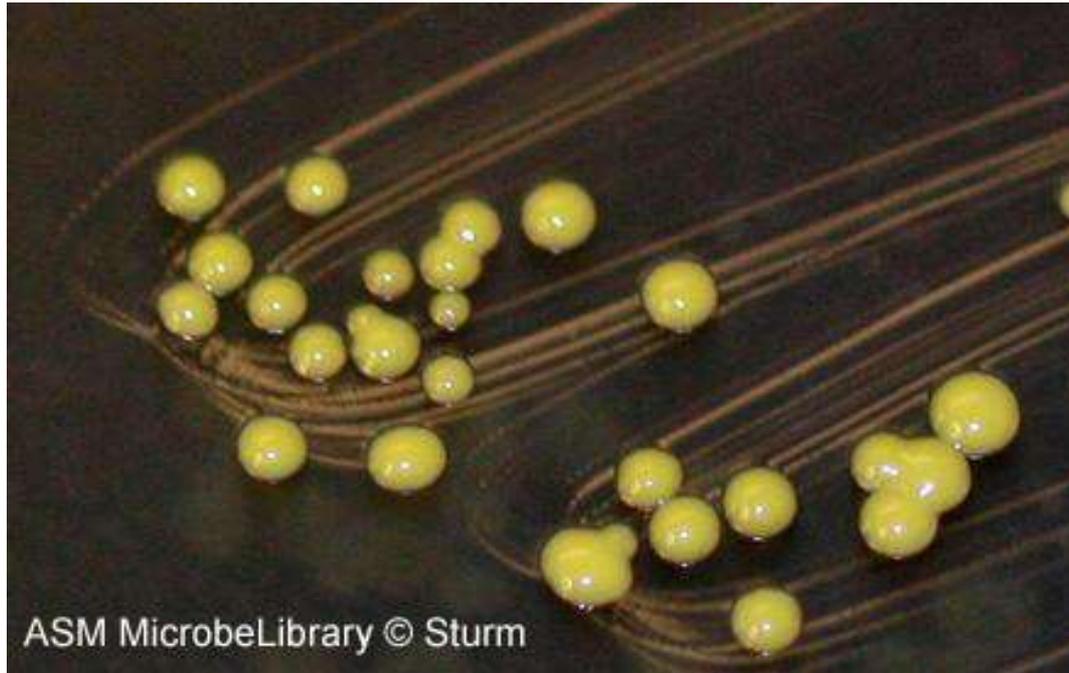


Streptomyces albus morphology (Enlarged view)FIG. 45. Filamentous margin. Streptomyces albus cultivated on nutrient agar. (Bryan MacDonald, Christopher Adams, and Kyle Smith, Brigham Young University, Provo, UT)



Streak plate isolation of *Mycobacterium smegmatis* on trypticase soy agar

FIG. 46. Streak plate isolation of *Mycobacterium smegmatis* on trypticase soy agar (TSA) incubated for 96 hours at 37°C. Note the rough texture of colonies characteristic of this organism. (Tasha L. Sturm, Cabrillo College, Aptos, CA)



Streak plate isolation of *Micrococcus luteus* on trypticase soy agar

FIG. 47. Streak plate isolation of *Micrococcus luteus* on trypticase soy agar (TSA) incubated for 72 hours at 37°C. Note the lemon-yellow colonies characteristic of this organism. (Tasha L. Sturm, Cabrillo College, Aptos, CA)



Colonial morphology of *Escherichia coli* and *Micrococcus luteus*

FIG. 48. Streak plate isolation of a mixed broth culture showing colonial morphology of *Escherichia coli* (white colonies) and *Micrococcus luteus* (yellow colonies). The culture was grown on trypticase soy agar (TSA) and incubated for 72 hours at 37°C. (Tasha L. Sturm, Cabrillo College, Aptos, CA)



*Bacillus cereus* colonial morphology

FIG. 49. Streak plate isolation showing colonial morphology of *Bacillus cereus* on trypticase soy agar (TSA) incubated for 24 hours at 37°C. Note the rough and dry texture characteristic of this organism's growth. (Tasha L. Sturm, Cabrillo College, Aptos, CA)



*Serratia marcescens* colonial morphology

FIG. 50. *Serratia marcescens* colonial morphology. Streak plate isolation of *Serratia marcescens* on trypticase soy agar (TSA) incubated at 37°C for 24 hours then at room temperature for 24 hours to allow for temperature-sensitive pigment production. Note the slightly umbonate, brick red colonies characteristic of this organism. (Tasha L. Sturm, Cabrillo College, Aptos, CA)



Unknown Organism Exhibiting Mounding Growth

FIG. 51. Partial isolate of an unknown organism on trypticase soy agar exhibiting spreading and mounding in an irregular-rhizoid form with lobate margins. The colony exhibited an opaque yellow-orange pigment with a mucoid surface. This sample was obtained from a floor swab and incubated at 37°C. (Tasha Sturm and Marina Sturm, Cabrillo College, Aptos, CA)



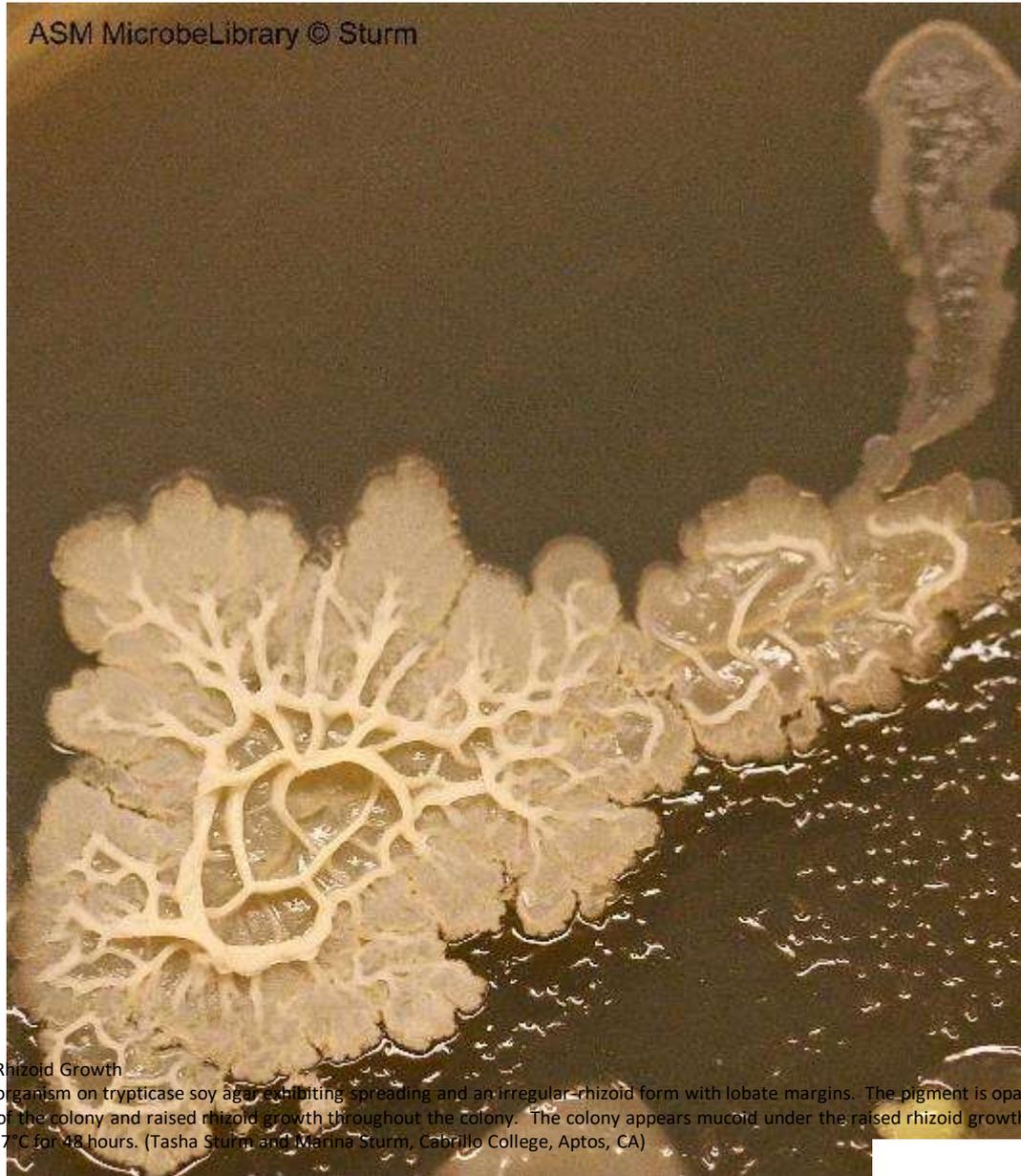
Unknown Fungal Isolate on Trypticase Soy Agar Exhibiting Small Round Colonies

FIG. 52. An unknown fungal isolate on trypticase soy agar exhibiting small round colonies. A white base of hyphae surrounds green and yellow grainy spore formation in the center of the colony. The sample was obtained from a floor swab and incubated at 37°C for 48 hours. (Tasha Sturm and Marina Sturm, Cabrillo College, Aptos, CA)



#### Unknown Organism Exhibiting Glossy Rhizoid Growth

FIG. 53. Partial isolate of an unknown organism on trypticase soy agar exhibiting spreading and an irregular-rhizoid form with lobate margins. The pigment is opaque white-beige with a mucoid surface over most of the colony. A dry, dull, matte surface appears toward the outer edge of one end of the colony. The sample was obtained from a floor and incubated at 37°C for 48 hours. (Tasha Sturm and Marina Sturm, Cabrillo College, Aptos, CA)



Unknown Organism Exhibiting Rhizoid Growth

FIG. 54. Isolate of an unknown organism on trypticase soy agar exhibiting spreading and an irregular-rhizoid form with lobate margins. The pigment is opaque white with a dry, dull, matte surface toward the outer edge of the colony and raised rhizoid growth throughout the colony. The colony appears muroid under the raised rhizoid growth. The sample was obtained from a floor swab and incubated at 37°C for 48 hours. (Tasha Sturm and Marina Sturm, Cabrillo College, Aptos, CA)



Isolation of an Unknown Bacterium on Trypticase Soy Agar FIG. 55. Isolation of an unknown bacterium on trypticase soy agar (TSA) exhibiting spreading and rhizoid growth. The pigment is opaque white-beige with a mucoid surface towards the center of the colony and a matte surface towards the edges. The initial sample was obtained from a swab taken from the bottom of a shoe and incubated at 37 °C for 48 hours. The bacterium was subcultured by cutting a chunk of the agar containing the organism and placing it in the middle of a TSA plate then incubating for 1 week at 37 °C. (Tasha Sturm, Cabrillo College, Aptos, CA)



Close-up View of the Edges of an Unknown Bacterium on Trypticase Soy Agar FIG. 56. Close-up view of the edges of an unknown bacterium on trypticase soy agar (TSA) exhibiting spreading and rhizoid growth. The pigment is opaque white-beige with a mucoïd surface towards the center of the colony and a matte surface towards the edges. The initial sample was obtained from a swab taken from the bottom of a shoe and incubated at 37 °C for 48 hours. The bacterium was subcultured by cutting a chunk of the agar containing the organism and placing it in the middle of a TSA plate then incubating for 1 week at 37 °C. (Tasha Sturm, Cabrillo College, Aptos, CA)



An unknown airborne environmental isolate on Mueller-Hinton agarFIG. 57. An unknown airborne environmental isolate on Mueller-Hinton agar exhibiting a single circular colony. White hyphal growth can be seen throughout the colony with a slight pink coloration in the center. The water droplets (exudate) that can be seen on the outer edges of the colony, not in the center, is a result of respiration. This sample was grown at 4°C for one month. (Tasha Sturm, Cabrillo College, Aptos, CA)



An unknown airborne environmental isolate on Mueller-Hinton agar FIG. 58. An unknown airborne environmental isolate on Mueller-Hinton agar exhibiting a single circular colony growing on the edge of the plate. White hyphal growth on the outer edges of the colony followed by: concentric rings of green grainy spore formation with exudate (water droplets resulting from respiration); white grainy spore formation; and finally a pinkish center. The sample was grown at 4°C for one month. (Tasha Sturm, Cabrillo College, Aptos, CA)