
Pseudomonas aeruginosa

P. aeruginosa is gram-negative, motile, obligate aerobic rods. It occurs as single bacteria, in pairs, and occasionally in short chains.

P. aeruginosa can secrete a variety of pigments, including: Pyocyanin (blue), Pyoverdine (yellow-green and fluorescent), Pyorubin (red), and Pyomelanin (brown- black). These can be used to identify the organism

Diagnosis

- It is citrate, catalase, and oxidase positive.
- Gram stain is performed, which may show Gram-negative rods.
- *P. aeruginosa* produces colonies with a characteristic "grape-like" or corn taco like odor on bacteriological media.
- On **Nutrient agar** *Pseudomonas aeruginosa* after aerobic incubation at 37°C for 24 hours, produce fluorescent greenish color and emit a characteristic fruity odor.
- On **MacConkey agar** (as it does not ferment lactose) and the pigments are often poorly observed.
- On **Blood agar** surrounded by a zone of hemolysis.
- On **Cetrimide agar** include production of the blue-green pigment pyocyanin and growth at 42 °C. It is a selective agar for *Pseudomonas aeruginosa*.

Biochemical test

| Test | Results |
|-----------------------------|----------------|
| Indole | Negative (-ve) |
| Methyl-red | Negative (-ve) |
| Voges-Proskauer | Negative (-ve) |
| Citrate | Positive |
| Oxidase | Positive |
| H ₂ S production | Negative (-ve) |
| Urease | Negative (-ve) |
| Motility | Positive |
| Catalase | Positive |
| nitrate reduction | Positive |
| Gelatin Hydrolysis | Positive |

Vibrio cholerae

V. cholerae is Gram-negative and comma-shaped. Initial isolates are slightly curved, whereas they can appear as straight rods upon laboratory culturing. The bacterium has a flagellum at one cell pole as well as pili.

Vibrio cholerae produces an enterotoxin that causes cholera, a profuse watery diarrhea that can rapidly lead to dehydration and death.

Diagnosis

- An effective selective medium is **thiosulfate-citrate-bile salts-sucrose (TCBS) agar**, on which vibrio cholera is sucrose-fermenting produce a distinctive yellow colony.
- Grow somewhat poorly on usual enteric diagnostic media (**MacConkey agar or eosin-methylene blue agar**).
- They can also be isolated from stool samples or rectal swabs from cholera cases on simple **meat extract (nutrient) agar** or bile salts agar at slightly alkaline pH values.

Following observation of characteristic colonial morphology, microorganisms can be confirmed as *vibrio cholera* by a rapid slide agglutination test with specific antiserum.

Kligler's iron agar K/A, no gas, no H₂S

A positive oxidase tests

| Basic Characteristics | Properties (<i>Vibrio cholerae</i>) |
|-----------------------|---------------------------------------|
| Capsule | Non-Capsulated |
| Citrate | +ve |
| Flagella | Flagellated |
| Gas | -ve |
| Gelatin Hydrolysis | +ve |

| | |
|----------------------|----------------|
| Gram Staining | -ve |
| H ₂ S | -ve |
| Hemolysis | Beta Hemolysis |
| Indole | +ve |
| Motility | Motile |
| MR (Methyl Red) | -ve |
| Nitrate Reduction | +ve |
| Oxidase | +ve |
| Shape | Rods |
| Spore | Non-Sporing |
| String Test | +ve |
| Urease | -ve |
| VP (Voges Proskauer) | Variable |