

PSEUDOMONAS

PROFESSOR DOCTOR

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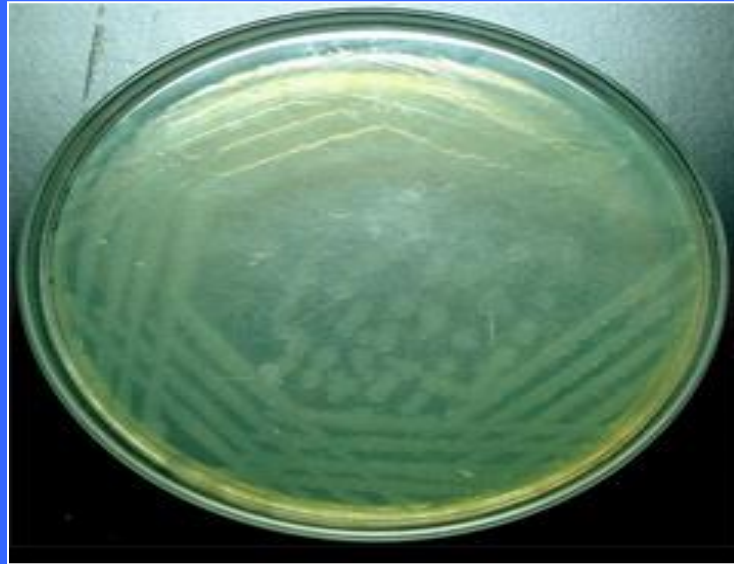
❑ Morphology:

- Gram negative bacilli, motile.

❑ Cultural characters:

- Aerobe.
- On nutrient agar medium: greenish colouration of the medium due to production of diffusible exopigment which consists of **pyocyanin (blue)** and **pyoverdin (yellow green)**.
- On blood agar medium: some strains are hemolytic.
- Sweet grape-like odour

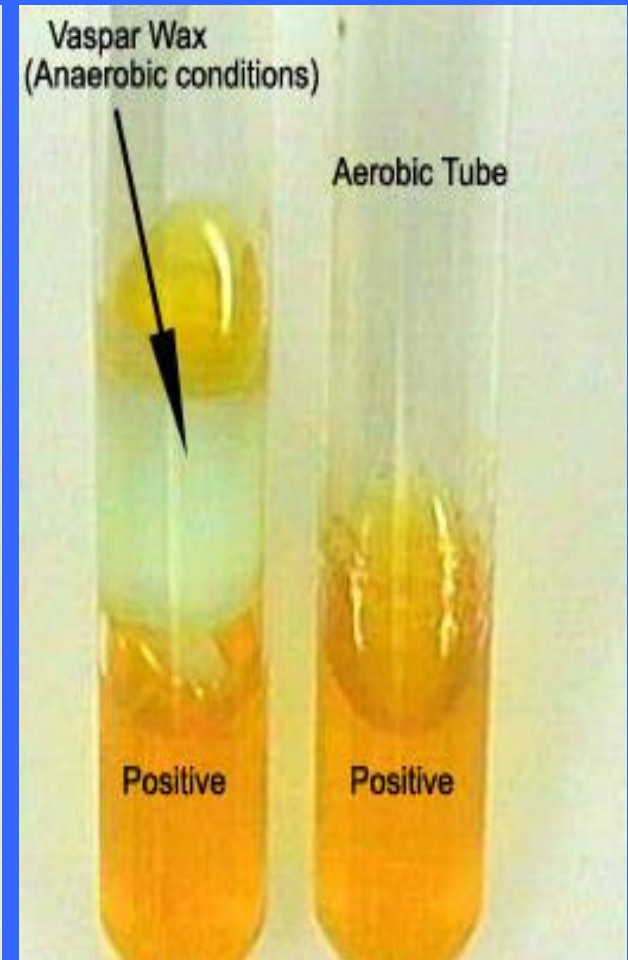
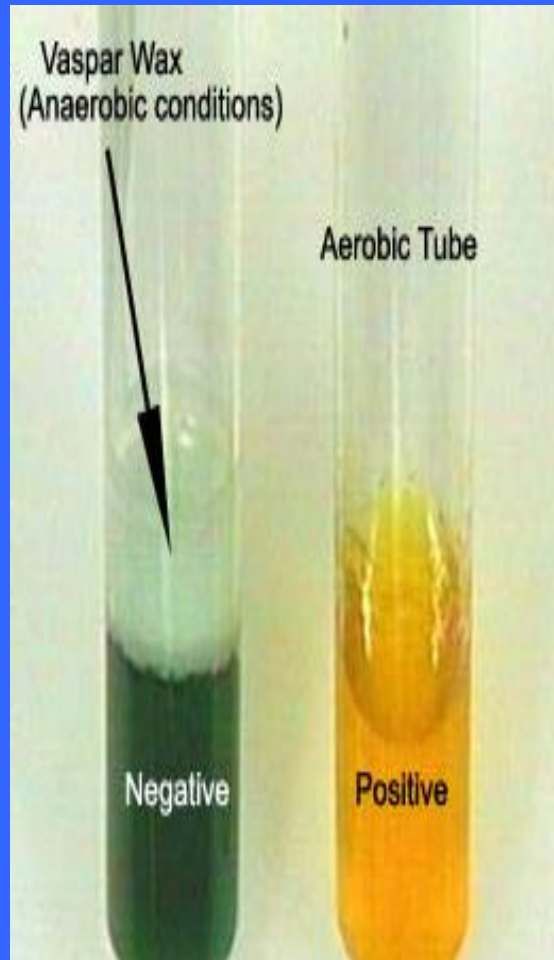
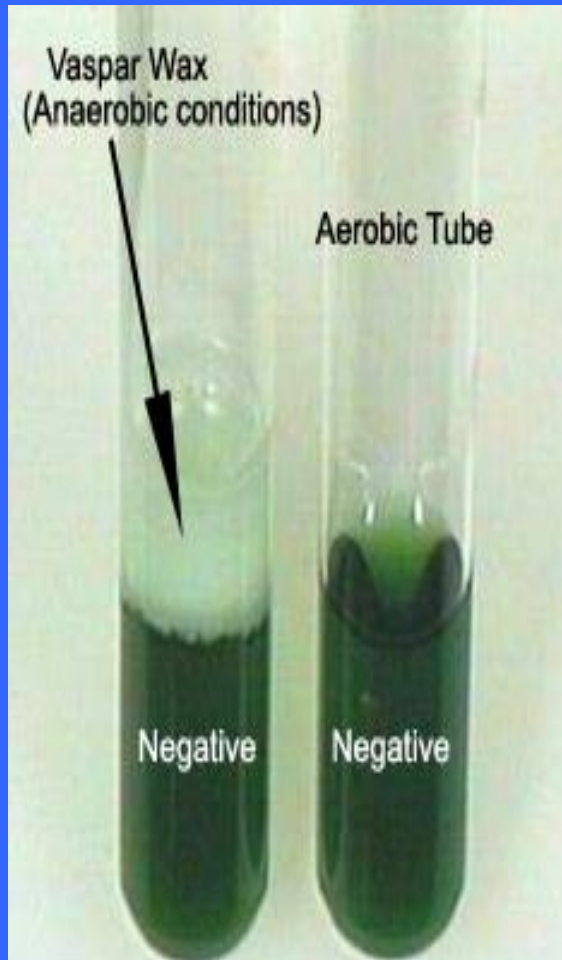
(Pseudomonas on nutrient agar)



❑ Biochemical reactions:

- *Pseudomonas aeruginosa* is oxidase positive.
- Does not ferment any sugar.
- Acid is produced from glucose by oxidation only.

(Oxidation/fermentation reactions)



❑ Virulence:

- Invasion.
- Pili for attachment.
- Endotoxin.
- Exotoxin A: very similar to diphtheria toxin in its action. It causes tissue necrosis.
- Enzymes such as elastase and protease.
- Strains isolated from cystic fibrosis patients possess glycocalyx (biofilm) which mediate adherence of the organism to mucous surfaces + protection from antibodies and phagocytosis.

❖ *Pseudomonas aeruginosa* is found in soil, sewage and water. May be commensal in the intestine.

❑ Diseases caused by pseudomonas:

1. Urinary tract infection.
2. Wound infection.
3. Otitis externa.
4. Corneal ulcers in contact lens users.
5. Ecthyma gangrenosum.
6. 10-20% of hospital acquired infections.

(Ecthyma gangrenosum)



Pseudomonas causes 10 – 20 % of nosocomial infections due to:

- Their ability to grow in aqueous solutions.
- Their remarkable ability to withstand disinfectants.
- The presence of compromised people in hospitals such as those with extensive burns, cystic fibrosis and catheters.

❑ Diagnosis of pseudomonas infections:

❖ Specimen:

- According to the site of infection.
- The pus from the lesion may be greenish blue.

❖ Direct smear:

- Gram negative bacilli + pus cells.

❖ Culture on nutrient gar:

- Identification of the growing colonies is done by:

Colonial morphology

Greenish blue colouration of the medium + grape like odour

Gram stain

Gram negative bacilli

Biochemical reactions

Oxidase positive

Oxidation of glucose with acid production

For epidemiological studies

Bacteriophage and pyocin typing

- ❑ Treatment of pseudomonas infections:
- ❖ Resistant to many antibiotics.
- ❖ So, antibiotic susceptibility must be done for selection of the antibiotic.
- ❖ However, pseudomonas may respond to ticarcillin or piperacillin plus aminoglycoside such as gentamicin.