



Culture media

The nutrient preparation on which microorganism is grown in the laboratory.

A culture medium is essentially composed of basic elements, to which added different growth factors that will be specific to each bacterium and necessary for their growth.



Main components of culture media:

- Water
 - Peptone
 - Meat extract
 - Yeast extract
 - Mineral salts
 - Carbohydrates
- protein sources*
- source of energy*

➤ **Agar:** "Inert polysaccharide from sea weed",

له ما يستخدمها
الكائنات للتمتع

بنسوله ال بودرة

Non-nutritive and not metabolized by microorganism,

It is solidifying agent which dissolves at 90-100 °C and solidify at 40 °C.

بنسعه الدم و درجة الحرارة كحد اقصى 50 تكونه لسا ما صار جامد و بعد ما يتبرجامه ال (agar) فيه agar 100 g



A) Liquid media:

➤ **Examples:** Peptone water, Broth, Blood culture bottle.

مشربة الكوفة
كع غذاء ممتاز للبكتيريا

الأأمثلة
والاستخدام



➤ **Uses:**

- For biochemical reactions.
- For blood culture.
- To test large volume of sample as water.
- As enrichment media.
- Transport media.



9 Blood culture bottle



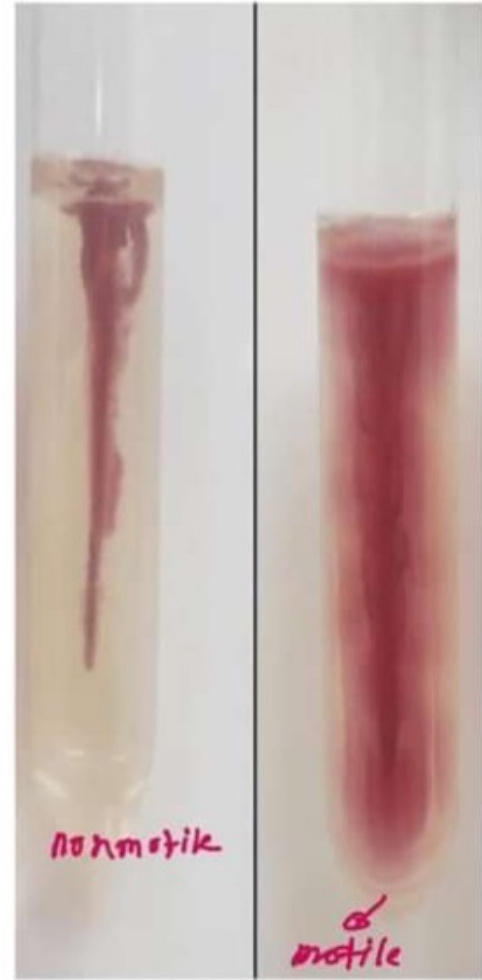
Nutrient broth

C) Semi-solid media:

➤ **Prepared by:** Decreasing agar concentration.

“Contain 0.5 % agar”

➤ **Uses:** Motility testing.



Simple Media

Q

➤ Used for:

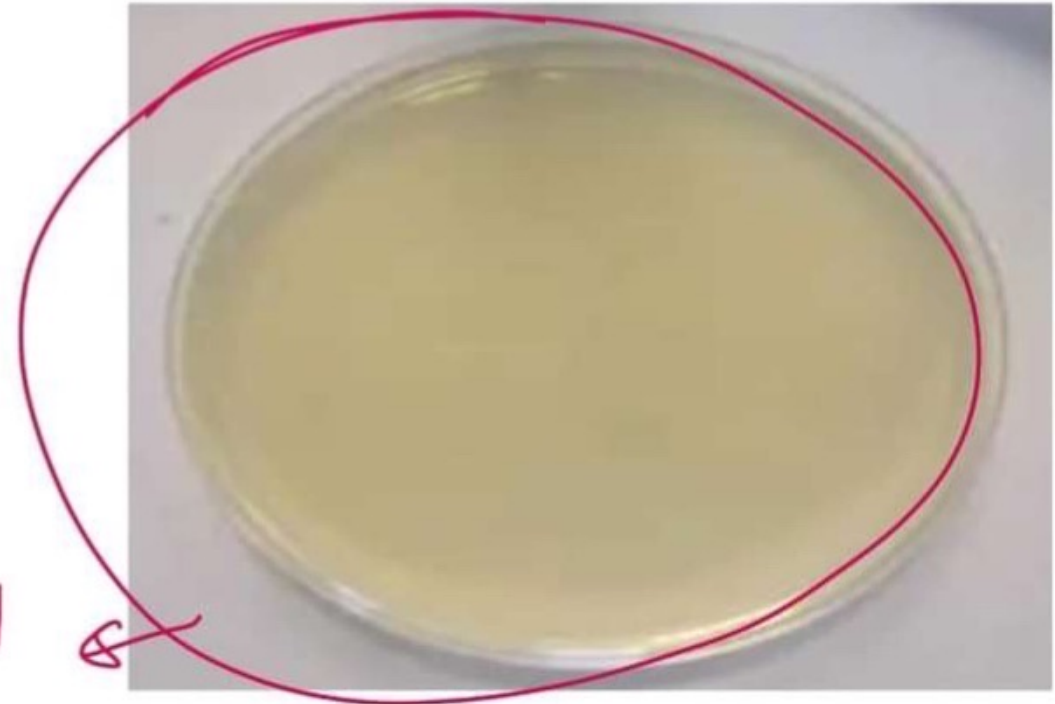
- Support growth of microorganisms that do not have special nutritional requirement.
- As a base for other media.

➤ Examples:

- Peptone water
- Nutrient broth
- Nutrient agar

مزرعة

المغذيات
البيولوجية



Nutrient agar

Selective media

Contain some chemicals, dyes or antibiotic which inhibit the growth of certain organisms & allow the growth of others.

Examples:

- Lowenstein-Jensen medium (L.J) (for Mycobacterium tuberculosis).
- Blood tellurite agar (for Diphtheria).
- Thayer-Martin medium (for Neisseria).
- Thiosulphate Citrate Bile Sucrose (TCBS) (for vibrio).
- Mannitol Salt Agar (for staphylococci).
- Salmonella-Shigella Agar.

inhibitory



Lowenstein-Jensen

MacConkey agar

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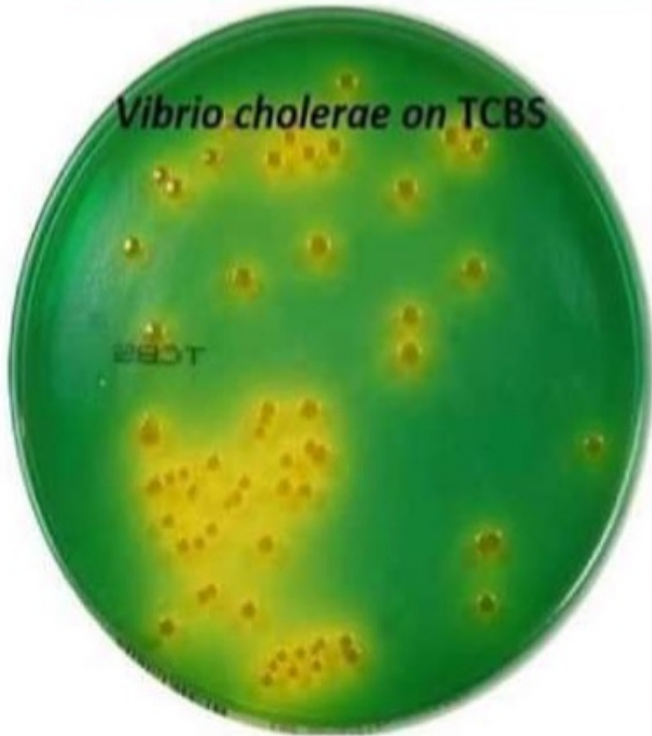
- Contain lactose & neutral red indicator.
- Differentiate between Lactose fermenters (pink colonies) e.g E.coli, and Non lactose fermenters (pale yellow colonies) e.g Salmonella



Thiosulphate Citrate Bile Sucrose (TCBS)



- Contain sucrose & **bromothymol blue** indicator.
- Differentiate between vibrio cholera (yellow colonies) and non-cholera vibrio (green colonies).



کامل

Enrichment media



Fluid containing some substances which stimulate the growth of some organisms on expense of the unwanted organisms.

Examples:

- Selenite broth & Tetrathionate broth (for isolation of Shigella & Salmonella from stool).
- Alkaline peptone water (for isolation of Vibrio cholera).

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Not neutral Transport media

Transport media for microorganisms are a non-nutritive, balanced, buffered medium that provides a controlled environment to preserve the viability of bacteria during transport without allowing them to multiply, when specimens cannot be cultured immediately after collection.

Examples:

- Amies Transport Medium.
- Stuart's medium.



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Anaerobic culture



Anaerobic cultivation is essential for bacteria that cannot grow in the presence of O₂ e.g. Clostridium & Bacteroids.

The following methods are used for anaerobiosis:

➤ Use of media containing reducing compounds as:

- **Robertson cooked meat medium.**
- **Thioglycolate broth.**



Robertson cooked meat medium

➤ Replacement of oxygen by hydrogen using **Gas-pak jar.**

Bacterial culture techniques

A) Inoculation: – introduction of a sample into a culture media (By sterile loop and using aseptic technique).

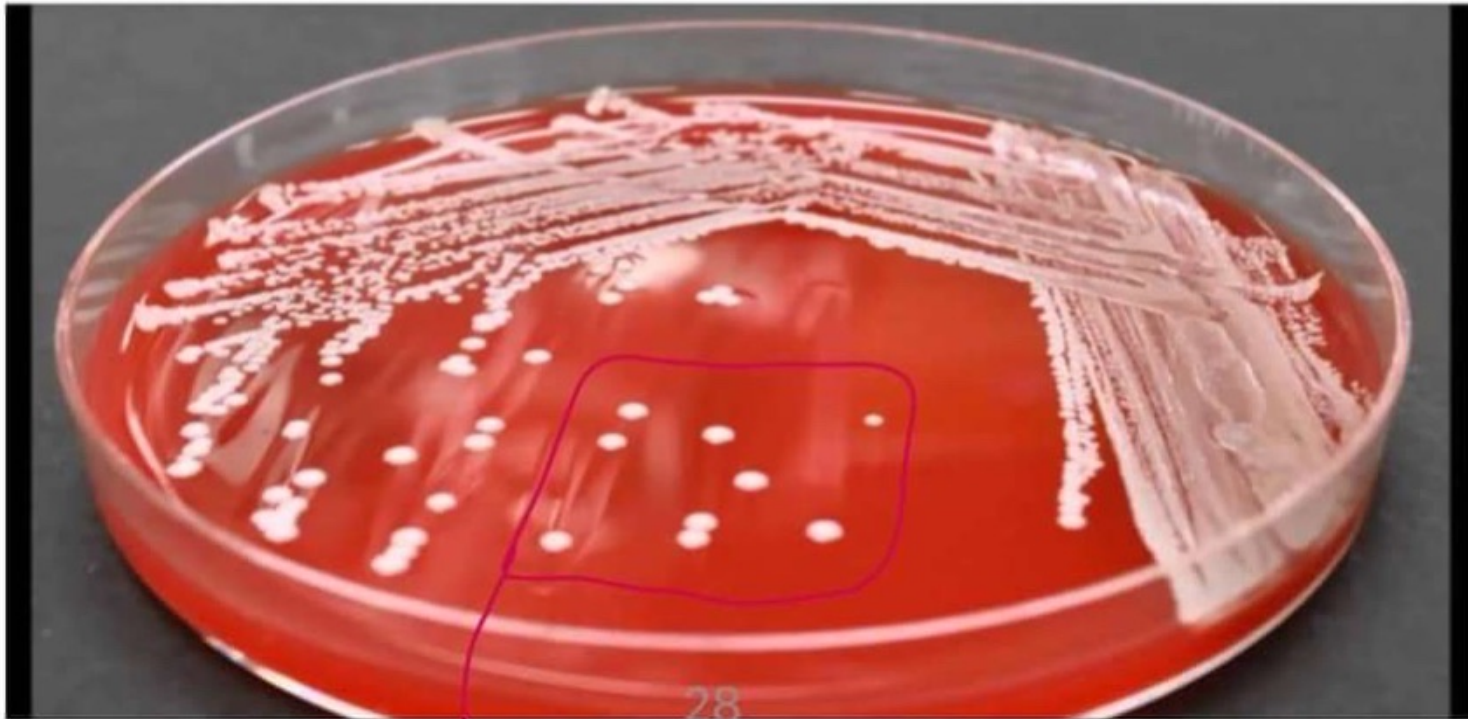
- **Inoculation of fluid media**
- **Inoculation of solid media:**
 - **Streak culture**
 - **Slant culture**
 - **Stab culture**
 - **Lawn culture**

B) Incubation: under conditions that allow growth.

(i.e. suitable temperature, humidity, CO₂%,..)

Streak culture

Aim to obtain pure culture i.e. an isolated growth of a single bacterium. Each bacterium divide repeatedly to give rise to a separate colony.



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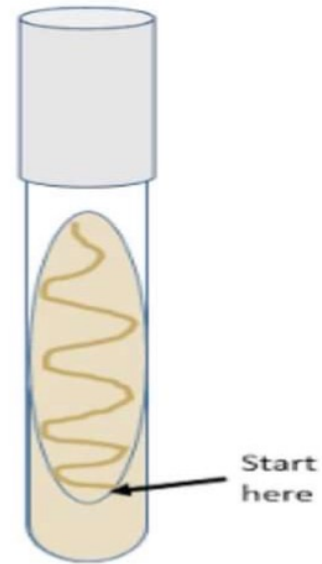
SC

Slant culture

For performing biochemical tests
e.g. Triple sugar iron test.



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Stab culture

For motility test



Hold needle vertically,
stab straight down the
center.

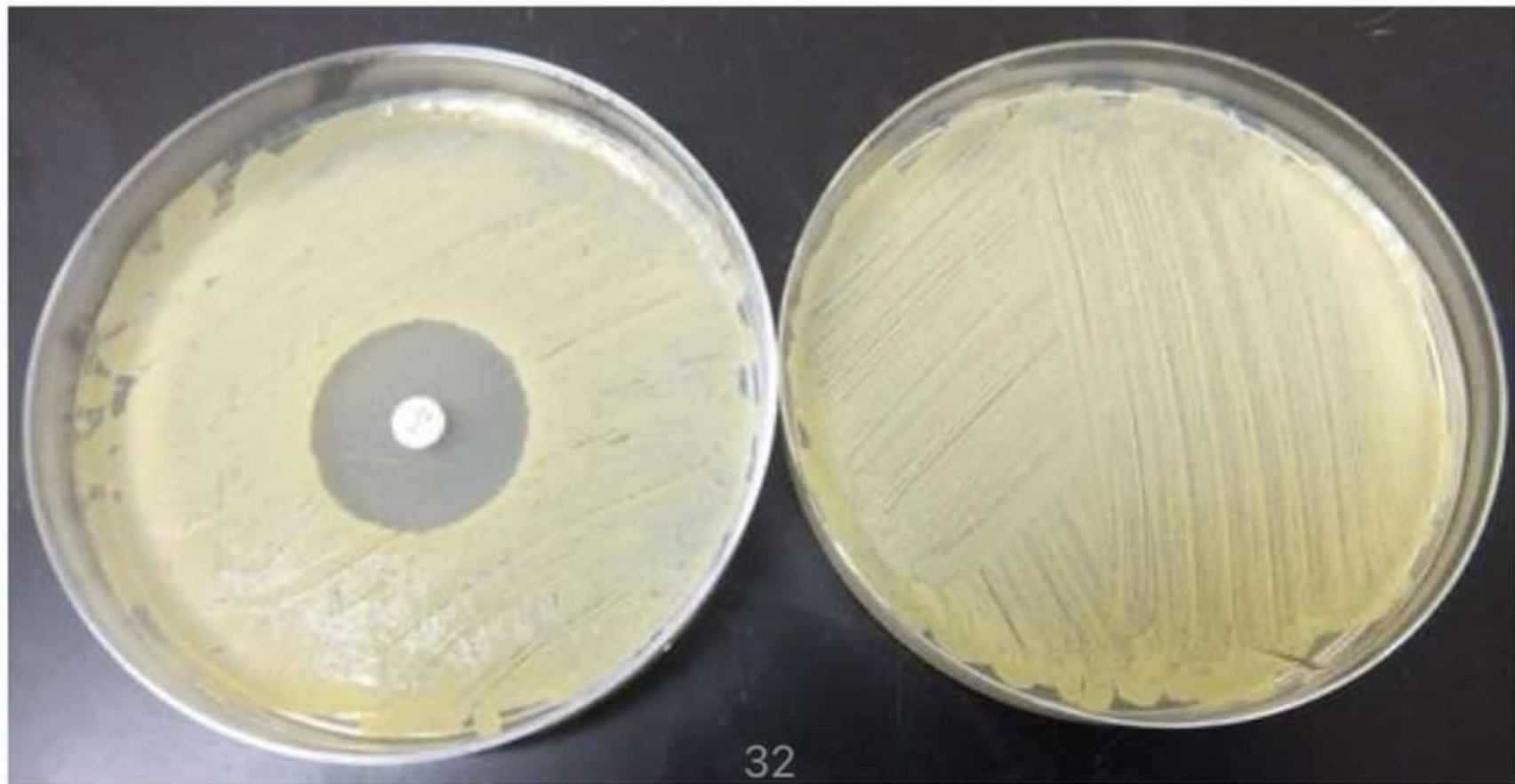


Remove needle along
the original stab line.

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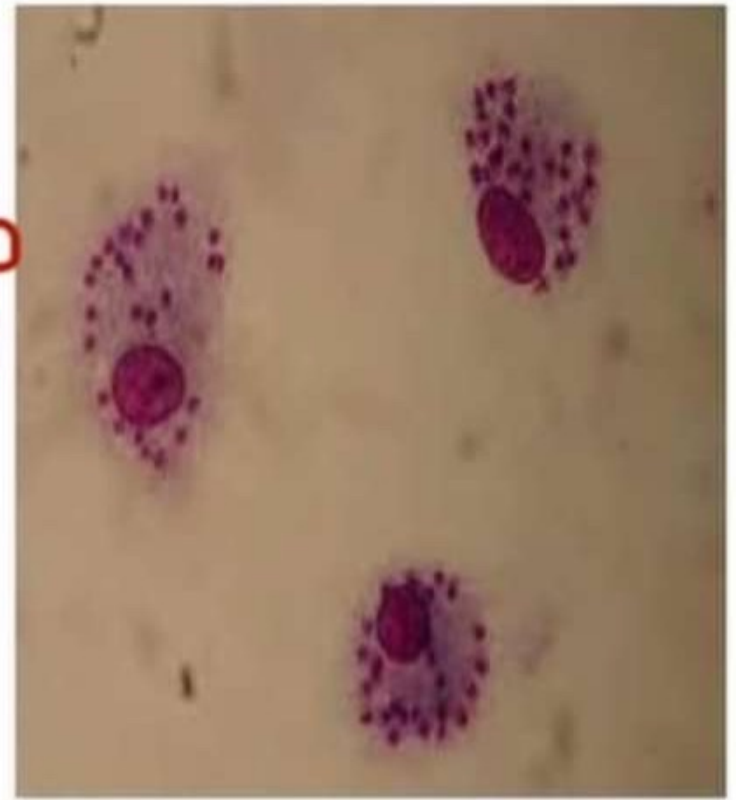
Lawn culture

For antibiotic sensitivity (Disc diffusion)





Lab
(6)



**Promastigote of
Leishmania donovani
Infective stage**

**Amastigote of
Leishmania donovani
Diagnostic stage**

Lab(6)



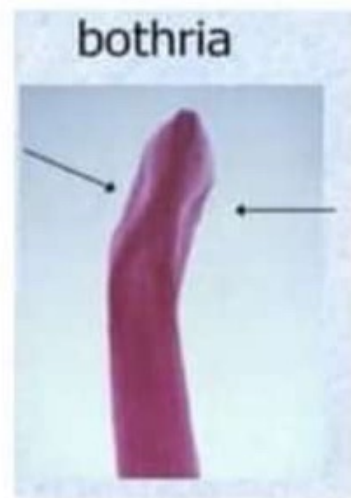
Echinococcus granulosus
Adult worm



Taenia solium
Scolex
(4Suckers&hook)



Taenia saginata
Scolex
(4Suckers only)

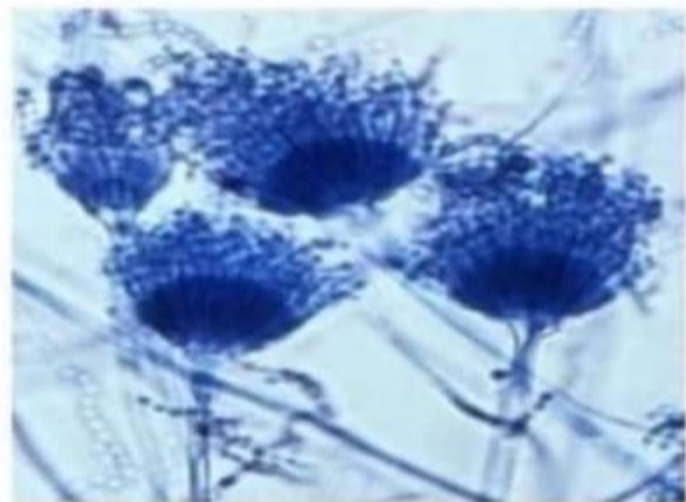


Diphylobothrium latum
Scolex
(Bothrium=Groove)

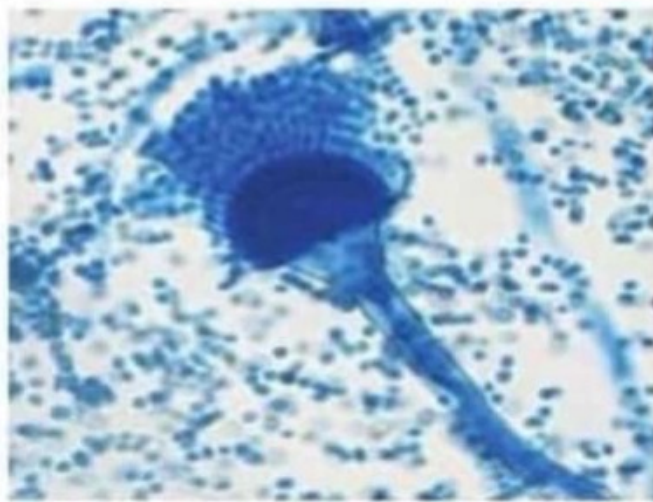
Lab (6)

Aspergillus spp.

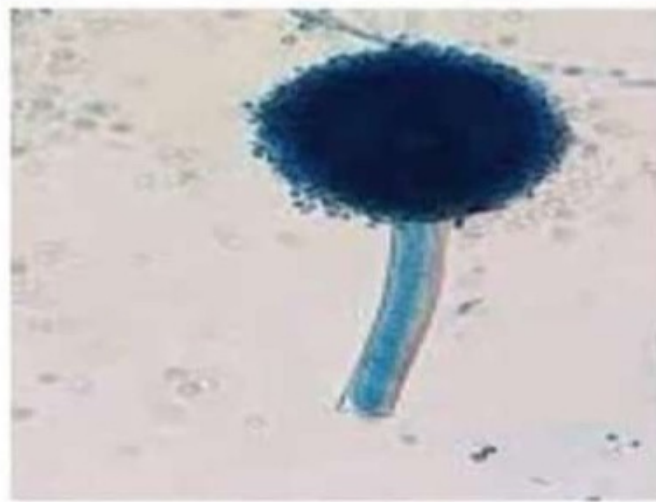
Lactophenol cotton blue preparations shows **filamentous septate hyphae** with characteristic **aspergillus head**.



A. Fumigatus
Flask shaped head



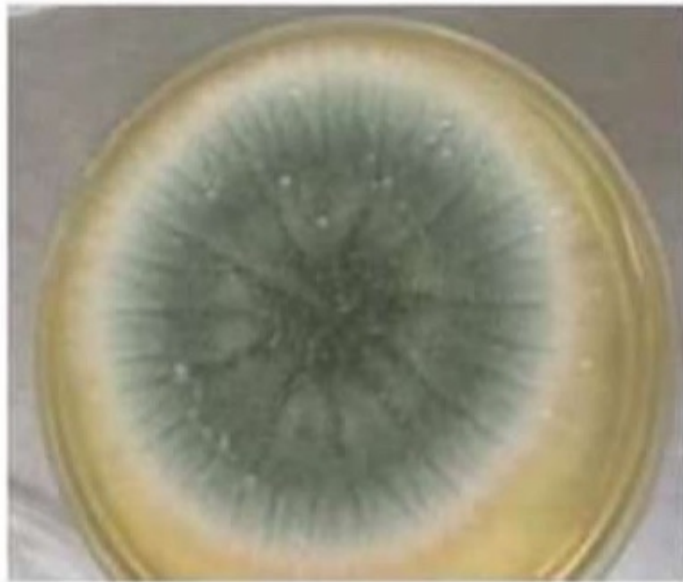
A. Flavus
Hemi-spherical head



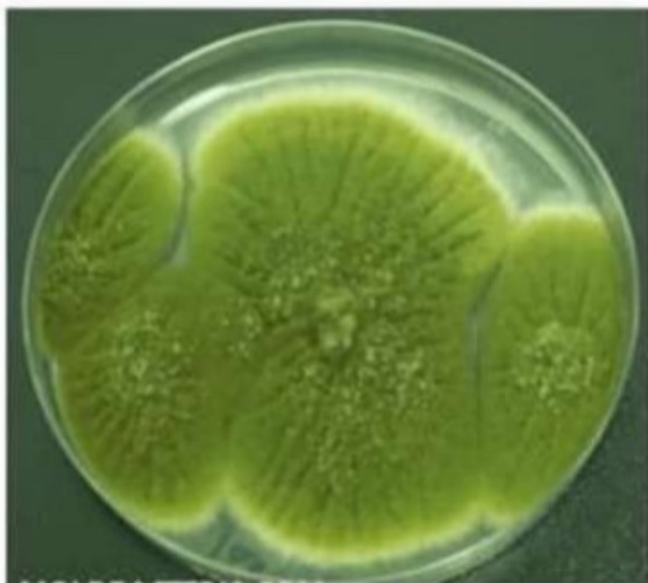
A. Niger
Rounded head

Lab(6)

On Sabouraud's agar



A. Fumigatus
Smoky green spores



A. Flavus
Yellowish green spores



A. Niger
Black spores