Lab 7 Soil Microbiology

Melanin pigment production

Many of microorganisms in the soil have the ability to produce the enzyme (Tyrosinase),which used to oxidize the amino acid tyrosine (that located in the environmental of the microorganism as a single source of carbon and energy) to Melanin according to the following equation:

L – Tyrosine $\xrightarrow{\text{Tyrosinase (oxidation)}}$ Melanin (dark pigment)

Types of microorganisms producing enzyme:

bacteria: Streptomyces , Polyangium .

Fungi : Epicoccum .

Procedure :

1-Preparation the media (Tyrosine agar) add (0.5%) of the L- Tyrosine to the nutrient agar.

2-Make serial dilution soil to (10^{-4}).

3- Transfer (0.1) ml of soil diluted in agar plate , then spread the sample on agar plate by spreader.

4-Incubated at a temperature (28 c) for (2- 3)day .

5- After incubation observed the change the color of the media to brown or brown -greenish or black as an indication of the production of melanin.

Melanin is produced by the oxidation of the amino acid tyrosine by Tyrosinase .

Melanins also protect microorganisms, such as bacteria and fungi, against stresses that involve cell damage such as UV radiation from the sun, protects against damage from high temperatures and oxidizing agents, melanins appear to play important roles in virulence and pathogenicity by protecting the microbe against immune responses of its host.

Semi carotenoids pigments production

Many microorganisms that live on surfaces exposed to lightuse semi carotenoids, a pigment found in the membrane cytoplasm have the ability to absorb light energy and provide protection from photo oxidation, which kills microorganisms.

Some carotenoids are produced by bacteria to protect from oxidative immune attack. The golden pigment that gives some strains of Staphylococcus aureus their name (aureusis = golden) is a carotenoid called staphyloxanthin.

Bacteria :Micrococcus roseus

Procedure :

1-Transfer (1 g) soil to the 50 ml of M-Medium broth in bottle.

2-Incubate at temperature (28 c) for (4-6 days) in the light.

3-After Incubation observed change the color of the media to yellow, then orange with time as an indication of the production of pigments carotenoids compared with the control which grown in the dark.