



Histidine discs

DD054

Histidine discs are used for amino acid decarboxylation test.

Directions

To determine amino acid decarboxylation, the Serine disc (DD054) is added in the Decarboxylase Broth Base, Moeller (M393) which is used as a negative control for studying decarboxylation or as a base for the addition of amino acids. The test organism is inoculated into the broth containing the Serine disc (DD054). The inoculated tubes are overlaid with sterile mineral oil and incubated at 35-37°C for up to 4 days. A purple colour indicates the decarboxylation.

Principle And Interpretation

Amino acid discs are used to differentiate the microorganisms on the basis of their ability to decarboxylate the amino acids. Moeller introduced the Decarboxylase Broth for detecting the production of decarboxylase(1). Prior to Moeller's work, bacterial amino acid decarboxylases were studied by Gale (2), Gale and Epps (3). Moeller Decarboxylase Broth Base (M393) contains dextrose which is the fermentable carbohydrate and pyridoxal is the co-factor for the decarboxylase enzyme. Bromo cresol purple and cresol red are the pH indicators in this medium. When the medium is inoculated with the dextrose fermenting bacteria, the pH is lowered due to acid production, which changes the colour of the indicator from purple to yellow. Acid produced stimulates decarboxylase enzyme. Amino acid decarboxylation yields amine. Formation of the amine increases the pH of the medium, changing the colour of the indicator from yellow to purple. If the organisms do not produce the appropriate enzyme, the medium remains acidic, yellow in colour. Inoculated tubes must be protected from air with a layer of sterile mineral oil. Exposure to air may cause alkalization at the surface of the medium which makes the test invalid.

Positive Test: Colour of the medium changes from yellow to purple

Negative Test: Colour of the medium changes to yellow or there is no change

Quality Control

Appearance

Filter paper discs of 10 mm diameter

Cultural Response

Cultural characteristics observed in Moeller Decarboxylase Broth Base (M393) with added Histidine discs (DD054) after an incubation at 35-37°C up to 4 days (Inoculated tubes are overlaid with sterile mineral oil).

Cultural Response

Organism	Inoculum (CFU)	Histidine decarboxylation
Cultural Response		
<i>Pseudomonas aeruginosa</i> ATCC 27853	50-100	Positive reaction
<i>Vibrio parahaemolyticus</i> ATCC 17802	50-100	Positive reaction
<i>Vibrio fischeri</i> ATCC 7744	50-100	Negative reaction

Storage and Shelf Life

Store the discs at 10-30°C. Use before expiry date on the label.

Reference

1. Moeller V., 1955, Acta Pathol. Microbiol. Scand. 36:158.
2. Gale G. F., 1940, Biochem. J., 34:392.
3. Gale and Epps, 1943, Nature, 152:327.

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