



PRODUCT SPECIFICATION SHEET

Ornithine Decarboxylase Broth (DM517)

Intended Use

Ornithine Decarboxylase Broth (DM517) is recommended for detection of the ability of microorganisms to decarboxylate ornithine.

Product Summary and Explanation

Decarboxylation is the process in which bacteria that possess specific decarboxylase enzyme attack amino acids at their carboxyl end (-COOH) to yield an amine or a diamine and carbon dioxide.⁽¹⁾ Decarboxylase tests are important in the differentiation and identification of a wide variety of microorganisms and are outlined in numerous standard methods.⁽²⁻⁵⁾ Moeller introduced the decarboxylase media for detecting the production of lysine and ornithine decarboxylase and arginine dihydrolase.⁽⁶⁻⁸⁾ These media are a useful adjunct to other biochemical tests for the speciation and identification of the *Enterobacteriaceae* and other gram-negative bacilli.⁽⁹⁻¹³⁾

The amino acid L-ornithine is decarboxylated by the enzyme ornithine decarboxylase to yield the diamine putrescine and carbon dioxide.^(8,9) Ornithine Decarboxylase Broth is based on the Taylors modification.⁽¹⁴⁾ It is recommended by the ISO Committee⁽¹⁵⁾ for the detection of ornithine decarboxylation by *Yersinia enterocolitica*. The production of ornithine decarboxylase is particularly useful for differentiating *Klebsiella* and *Enterobacter* species. *Klebsiella* species are non-motile and, except for *K. ornithinolytica*, do not produce ornithine decarboxylase, while most *Enterobacter* species are motile and, except for *E. agglomerans*, usually produce this enzyme.⁽¹¹⁾

Principles of the Procedure

Ornithine Decarboxylase Broth contains yeast extract which provides nitrogen and other nutrients necessary to support bacterial growth. The amino acid ornithine is added to detect the production of ornithine decarboxylase. Glucose is the fermentable carbohydrate, which during the initial stages of incubation, is fermented by the organisms with acid production, which results in colour change of the pH indicator Bromo cresol purple to yellow. The acidic condition also stimulates decarboxylase activity. If the organism produces the appropriate enzyme, i.e. decarboxylase, the amino acid (ornithine) in the medium is degraded, yielding a corresponding amine. Decarboxylation of ornithine yields putrescine. Production of this amine elevates the pH of the medium towards alkalinity, changing the color of the indicator from yellow to purple or violet. If the organism does not produce the appropriate enzyme, the medium remains acidic or yellow in colour.

Formula / Liter

Ingredients	Gms / Liter
L-Ornithine monohydrochloride	5.00
Yeast extract	3.00
Glucose	1.00
Bromo cresol purple	0.015
Final pH: 6.8 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	

Precautions

1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.

Directions

1. Suspend 9.01 grams of the medium in one liter of distilled water.
2. Heat if necessary to dissolve the medium completely.





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3. Dispense in test tubes and autoclave at 121°C, 15 psi pressure, for 15 minutes / validated cycle.
4. After inoculation overlay the tubes with 2-3 ml mineral oil.

Quality Control Specifications

Dehydrated Appearance	Light yellow to light green homogeneous free flowing powder
Prepared Medium	Dark purple coloured clear solution without any precipitate
Reaction of 0.9% Solution	pH : 6.8 ± 0.2 at 25°C
Gel Strength	Not Applicable

Expected Cultural Response: Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours. Inoculated tubes are overlayed with mineral oil.

Sr. No.	Organisms	Results to be achieved	
		Inoculum (CFU)	Growth
1.	<i>Escherichia coli</i> ATCC 25922	50-100	variable reaction
2.	<i>Enterobacter aerogenes</i> ATCC 13048	50-100	positive reaction, purple colour
3.	<i>Klebsiella pneumoniae</i> ATCC 13883	50-100	negative reaction, yellow colour
4.	<i>Proteus mirabilis</i> ATCC 25933	50-100	negative reaction, yellow colour
5.	<i>Proteus vulgaris</i> ATCC 13315	50-100	positive reaction, purple colour
6.	<i>Salmonella paratyphi A</i> ATCC 9150	50-100	positive reaction, purple colour
7.	<i>Salmonella typhi</i> ATCC 6539	50-100	negative reaction, yellow colour
8.	<i>Shigella flexneri</i> ATCC 12022	50-100	negative reaction, yellow colour
9.	<i>Shigella sonnei</i> ATCC 25931	50-100	positive reaction, purple colour
10.	<i>Yersinia enterocolitica</i> ATCC 27729	50-100	positive reaction, purple colour

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure

1. Inoculate the broth media by transferring one or two colonies from the surface of a fresh culture with an inoculating loop or needle and mix to distribute the culture throughout the medium.
2. Overlay the medium in each tube with 1 mL sterile mineral oil.
3. Incubate the tubes with caps tightened at 35 ± 2°C.
4. Examine for growth and decarboxylase reactions after 18-24, 48, 72 and 96 hours before reporting as negative.
5. Refer appropriate references for specific test procedures.

Results

The medium becomes purple to violet if the reaction is positive (alkaline). A yellow color indicates a negative test; i.e., the organism does not produce the appropriate enzyme. Refer appropriate references and test procedures for interpretation of results.





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Storage

Store the sealed bottle containing the dehydrated medium at 10 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

Expiration

Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

1. The decarboxylase reactions are part of a total biochemical profile for members of the *Enterobacteriaceae* and related organisms. Results obtained from these reactions, therefore, can be considered presumptively indicative of a given genus or species. However, conclusive and final identification of these organisms cannot be made solely on the basis of the decarboxylase reactions.
2. *Salmonella gallinarum* gives a delayed positive ornithine decarboxylase reaction, requiring 5-6 days incubation.
3. Many strains of *E. coli*, including those that ferment adonitol, may exhibit a delayed reaction.
4. Consult appropriate texts for detailed information and recommended procedures.

Packaging

Product Name : Ornithine Decarboxylase Broth

Product Code : DM517

Available Pack sizes : 100gm

References

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Further Information

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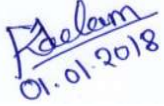


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