PRODUCT SPECIFICATION SHEET

Vogel-Johnson Agar Base w/o Tellurite (V.J. Agar) (DM462)

Intended Use

Vogel-Johnson Agar Base w/o Tellurite (V.J. Agar) (DM462) is recommended for selective isolation of coagulase-positive, mannitol fermenting *Staphylococcus aureus* from heavily contaminated food and clinical specimen.

Product Summary and Explanation

Staphylococcus aureus, a gram-positive, spherical bacterium, is a common invader of the human skin and mucosa. It is a causative agent of skin and wound infections, urinary tract infections, pneumonia and bacteremia. It is also commonly implicated in food poisoning. It causes spoilage or chemical changes in cosmetic products.[1]

In 1955, Zebovitz, Evans, and Niven,[2] developed Tellurite-Glycine Agar as a selective plating medium for the quantitative detection of coagulase-positive staphylococci. This medium was modified by Vogel and Johnson in 1960 by the addition of phenol red as a pH indicator and by increasing the mannitol content.[3] Vogel-Johnson Agar is recommended for the microbial limit test in USP.[4] Vogel and Johnson Agar selects and differentiates coagulase-positive staphylococci that ferment mannitol and reduce tellurite.[5] V.J. Agar is specified in the standard methods for examination of cosmetics,[1,6] pharmaceutical articles and nutritional supplements.[4] In addition, the formulation complies with recommendations by the USP for microbial limit testing.[4]

Principles of the Procedure

Vogel-Johnson Agar Base w/o Tellurite contains casein enzymic hydrolysate which is a source of carbon, nitrogen, vitamins and minerals. Yeast extract supplies B-complex vitamins which stimulate bacterial growth. Mannitol is the carbohydrate. Dipotassium phosphate provides buffering to the medium. During the first 24 hours of incubation, contaminating organisms are almost inhibited by tellurite, lithium chloride and high glycine content. Coagulase-positive *staphylococci* reduce potassium tellurite to metallic free tellurium and thus produce black colonies surrounded by yellow zones. This yellow colour is due to phenol red indicator that turns yellow in acidic condition due to the fermentation of mannitol. If mannitol is not fermented, yellow zones are not formed. Also the colour of the medium around the colonies may even be a deeper red than normal due to utilization of the peptones in the medium. Prolonged incubation may result in the growth of black coagulase-negative colonies. Prepared plates of Vogel and Johnson Agar contain 0.2 g/L of potassium tellurite.

Formula / Liter

Ingredients	Gms / Liter
Casein enzymic hydrolysate	10.00
Yeast extract	5.00
Mannitol	10.00
Dipotassium phosphate	5.00
Lithium chloride	5.00
Glycine	10.00
Phenol red	0.025
Agar	16.00
Final pH: 7.2 ± 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.
3. Lithium chloride is harmful. Avoid bodily contact and inhalation of vapours. On contact with skin, wash with plenty of water immediately.

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Directions

1. Suspend 61.02 grams of the medium in one liter of distilled water.
2. Heat to boiling, to dissolve the medium completely, with frequent agitation.
3. Autoclave at 121°C, 15 psi pressure, for 15 minutes / validated cycle.
4. Cool to 45-50°C and add 20 ml of sterile 1% Potassium tellurite solution (MS024). Mix gently and pour into sterile Petri plates.

Quality Control Specifications

Dehydrated Appearance	Light yellow to pink homogeneous free flowing powder
Prepared Medium	Red coloured clear to slightly opalescent gel forms in Petri plates.
Reaction of 6.1% solution	pH 7.2 ± 0.2 at 25°C
Gel Strength	Firm, comparable with 1.6% Agar gel.

Expected Cultural Response: Cultural characteristics observed with added 1% Potassium tellurite solution (MS024), after an incubation at 35-37°C for 24-48 hours.

Sr. No.	Organisms	Results to be achieved				
		Inoculum (CFU)	Growth	Recovery	Colour of Colony	Mannitol Fermenta-tion
1.	*Escherichia coli ATCC 25922*	>=10^3	inhibited	0%	-	-
2.	*Proteus mirabilis ATCC 25933*	50-100	poor	10-20%	black	negative
3.	*Staphylococcus aureus ATCC 25923*	50-100	good-luxuriant	>=50%	black with yellow halo	positive
4.	*Staphylococcus epidermidis ATCC 12228*	50-100	fair-good	30-40%	translucent to blackish	negative
5.	*Escherichia coli NCTC 9002*	>=10^3	inhibited	0%	-	-
6.	*Escherichia coli ATCC 8739*	>=10^3	inhibited	0%	-	-
7.	*Staphylococcus aureus ATCC 6538*	50-100	good-luxuriant	>=50%	black with yellow halo	positive
8.	*Staphylococcus aureus NCIMB 9518*	50-100	good-luxuriant	>=50%	black with yellow halo	positive

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

Test Procedure

1. Refer to appropriate references for standard test procedures to obtain isolated colonies from specimens.
2. Incubate plates for 18-48 hours at 35 ± 2°C in an aerobic atmosphere.

Results

1. After incubation, examine the isolated colonies on the plated medium.
2. During the first 18-24 hours of incubation, most organisms, other than coagulase-positive staphylococci, are totally or markedly inhibited.
3. By 48 hours, many coagulase-negative, mannitol-fermenting or coagulase-negative, mannitol-negative staphylococci will appear on the medium.
4. The coagulase-positive cocci form small, black colonies on red plates.
5. If mannitol is fermented, the colonies are surrounded by yellow zones due to the color change of the phenol red indicator in response to the acid formation.
6. If mannitol has not been fermented, no yellow zone is present, and the color of the medium around the colonies may even be a deeper red than normal due to utilization of the peptones in the medium.

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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. For identification, organisms must be in pure culture. Morphological, biochemical and/or serological tests should be performed for final identification.
2. Consult appropriate texts for detailed information and recommended procedures.

Packaging

Product Name : Vogel-Johnson Agar Base w/o Tellurite (V.J. Agar)
Product Code : DM462
Available Pack sizes : 100gm/500gm

References

1. FDA Bacteriological Analytical Manual, 2005, 18th Ed., AOAC, Washington, D.C.
2. Zebovitz, Evans and Niven. 1955. J. Bacteriol. *70*:686.
3. Vogel and Johnson. 1960. Public Health Lab. *18*:131.
4. United States Pharmacopeial Convention, Inc. 2008. The United States pharmacopeia 31/The national formulary 26, Supp. 1, 8-1-08, online. United States Pharmacopeial Convention, Inc., Rockville, Md.
5. MacFaddin J. F., 1985, Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria, Vol. 1, Williams & Wilkins, Baltimore, Md.
6. Curry A. S., Graf J. G. and McEwen G. M., (Eds.), 1993, CTFA Microbiology Guidelines, The Cosmetic, Toiletry and Fragrance Association, Washington, D.C.

Further Information

For further information please contact your local MICROMASTER Representative.

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