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Candida Chromogenic Agar

Cat. 2207

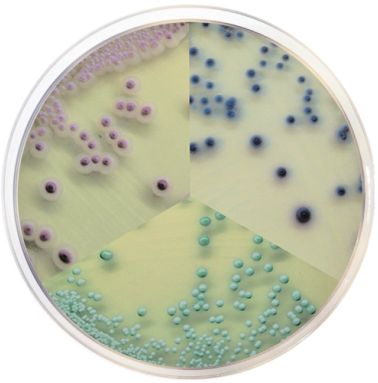
Differential and selective chromogenic medium for the isolation and quick identification of Candida spp. of clinical importance.

Practical information

Aplications	Categories
Selective isolation	Candida

Industry: Clinical

CE
IVD



Principles and uses

Candida Chromogenic Agar is an alternative chromogenic formulation to the traditional media for the detection and isolation of Candida spp.

The different species of Candida produce different kinds of infections. Candidiasis, the most common opportunistic fungal infection is frequently caused by Candida albicans. Candida tropicalis and Candida glabrata infections occur less often. Candida spp. are present in clinical specimens due to environmental contamination, colonization, or a disease process. Candida albicans is the most common and is usually susceptible to the antigfungal agents' azole group. However, Candida glabrata, Candida tropicalis and Candida krusei are azole tolerant, thus the rapid identification of the different species of Candida is essential for its correct diagnosis and treatment. Candida auris is an emerging multidrug-resistant yeast. Infection with C. auris is associated with high mortality rates, and it is often resistant to multiple classes of antifungal drugs.

Candida Chromogenic Agar allows the detection of Candida auris.

In the medium Glucose is the fermentable carbohydrate providing carbon and energy. Peptone provides nitrogen, vitamins, minerals and amino acids essential for growth. Chloramphenicol is an antibiotic which aids in isolating pathogenic fungi from heavily contaminated material, as it inhibits most contaminating bacteria. It is a recommended antibiotic for use with media due to its heat stability and wide bacterial spectrum. The chromogenic mixture allows the identification and differentiation of all three species of Candida albicans, Candida tropicalis and Candida krusei by producing easy-to-read results in one plate, since they present different colored colonies, Bacteriological agar is the solidifying agent.

Formula in g/L

Bacteriological agar	15	Chromogenic mixture	0,2
Growth factors	21,2	Inhibitors	0,5

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 36,9 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. AVOID OVERHEATING. DO NOT AUTOCLAVE. Dispense into Petri dishes.

Instructions for use

For clinical diagnosis, use any type of clinical sample (saliva, vagina ... etc.).

- Inoculate on the surface. Parallel striae with the handle or hyssop.
- Incubate in aerobic conditions at 35±2 °C for 24, 48 and 72 hours.

- Reading and interpretation of the results.
- Colonies of Candida albicans are green, those of Candida krusei and Candida auris are purple-pink and those of Candida tropicalis are blue.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Light beige	Clear amber, slightly opalescent	6,1±0,2

Microbiological test

Incubation conditions: (35-37 ºC / 24-48-72 h).

Microorganisms	Specification	Characteristic reaction
Candida albicans ATCC 10231	Good growth	Green colony
Candida tropicalis ATCC 1369	Good growth	Blue colony
Candida glabrata ATCC 2001	Good growth	White whit brown centre colony
Candida auris DSM 21092	Good growth	Purple-pink colony
Candida krusei ATCC 34135	Good growth	Purple-pink colony

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

Chromogenic Coliforms Agar (CCA) ISO

Cat. 2080

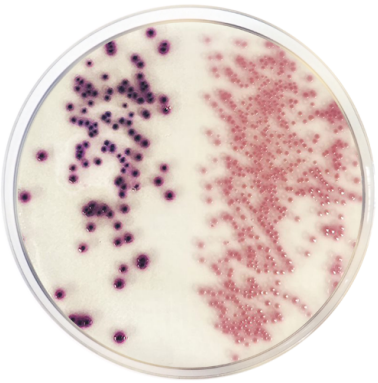
Selective medium for the simultaneous detection of E. coli and other coliforms in water samples.

Practical information

Aplications	Categories
Selective enumeration	Coliforms
Selective enumeration	Escherichia coli

Industry: Water

Regulations: ISO 11133 / ISO 9308



Principles and uses

Chromogenic Coliforms Agar (CCA) is a selective medium for the detection of E. coli and other coliforms in waters and foods. The recovery and enumeration of Escherichia coli and coliforms are important indicators of environmental and food hygiene. CCA is especially recomended for waters with low bacterial numbers, whether it is drinking water, disinfected pool water, or finished water from drinking water treatment plants.

The interaction of ingredients in the medium, such as peptone, sorbitol and pyruvate, grants a quick colony growth, including infectious coliforms and also permits the recovery of sublethal thermally injured coliforms. Tergitol-7 inhibits Gram-positive bacteria and some Gram-negative without affecting the coliform bacteria. Sodium chloride maintains the osmotic balance and phosphate salts act as a buffer system. Bacteriological agar is the solidifying agent.

Detection of ß-glucuronidase is widely used to differentiate Escherichia coli, as the enzyme is present in E. coli but not in other member of coliform group. The chromogenic mixture contains chromogenic substrates: Salmon-GAL and X-glucuronide. Coliform enzymes produced, ß-D-galactosidase and ß-D-glucuronidase, cleave these substrates resulting in the different coloration of bacteria colonies. The ß-D-galactosidase cleaves Salmon-GAL substrate, and gives a salmon-red color to the coliform colonies. The ß-D-glucuronidase, enzyme characteristic of E. coli, cleaves X-glucuronide, giving a blue color to these colonies. E. coli has the two enzymes and cleaves both chromogenic substances giving dark blue to violet colonies. Total coliforms are the sum of E. coli colonies plus salmon-red colonies. The addition of tryptophan to the medium allows the performance of the Indole test for further E. coli confirmation.

Formula in g/L

Enzymatic digest of casein	1	Bacteriological agar	10
IPTG	0,1	Salmon-beta-D-Galactoside	0,2
Sodium chloride	5	Sodium pyruvate	1
Sorbitol	1	Tergitol® 15-S-7 surfactant	0,15
Tryptophan	1	X-beta-G-glucuronide CHX salt	0,1
Yeast extract	2	Sodium dihydrogen phosphate x 2H2O	2,2
Di-sodium hydrogen phosphate	2,7		

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 26,45 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. AVOID OVERHEATING. DO NOT AUTOCLAVE. Cool to 45-50 ºC, homogenize gently and dispense into Petri dishes.

Instructions for use

For the enumeration of E. coli and coliform bacteria according to ISO 9308:
- Filter sample through a membrane .
- Place the membrane filter over a E. Coli Coliforms Chromogenic Agar plate.
- Invert Petri dish and incubate at 36±2 ºC during 21±3 h.
- Count the ß-D-galactosidase colonies (pink to red in color) as presumptive coliform bacterias that are not E. coli
-To avoid false positive results, caused by oxidase-positive bacteria, for example, Aeromonas spp, confirm bacterial colonies through an oxidase-negative reaction.
- The positive colonies ß-D-galactosidase and ß-D-glucuronidase (dark blue to violet) are counted as E. coli.
- The total coliform bacteria count is the sum of oxidase-negative colonies, ß-D-galactosidase-positive colonies (pink to red) and all colonies which dark blue to violet.
- Some Shigella strains contain the enzyme ß-D-glucuronidase and can grow as light blue colonies.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber	6,8±0,2

Microbiological test

According to ISO 11133:
Incubation conditions: (36±2 ºC / 21±3 h).
Inoculation conditions: Productivity quantitative (100±20. Min. 50 CFU) / Selectivity (10^4-10^6 CFU) / Specificity (10^3-10^4 CFU).
Reference media: TSA.

Microorganisms	Specification	Characteristic reaction
Pseudomonas aeruginosa ATCC 10145	Growth	Colorless colonies
Klebsiella aerogenes ATCC 13048	Good growth >70%	Red to pink colonies
Enterococcus faecalis ATCC 19433	Total inhibition	
Escherichia coli ATCC 25922	Good growth >70%	Dark blue to violet colonies
Escherichia coli ATCC 8739	Good growth >70%	Dark blue to violet colonies

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

Chromogenic Cronobacter Isolation Agar (CCI) ISO

Cat. 1446

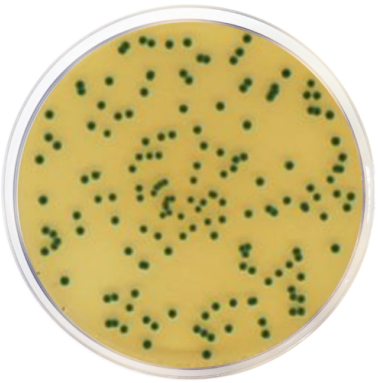
For the isolation of presumptive Cronobacter spp. in food products and environmental samples.

Practical information

Aplications	Categories
Selective isolation	Cronobacter

Industry: Food

Regulations: ISO 22964



Principles and uses

Chromogenic Cronobacter Isolation Agar (CCI) is a selective medium for the detection of Cronobacter spp. in food products and ingredients intended for human consumption and the feeding of animals, and environmental samples in the area of food production and food handling.

ISO 22964:2016 describes a horizontal method for the detection of Cronobacter spp. and recommend this medium for the isolation of Cronobacter spp.

Triptone provide nitrogen, vitamins, minerals and amino acids essential for growth. Yeast extract is source of vitamins, particularly the B-group, essential for bacterial growth. Sodium chloride supplies essential electrolytes for transport and osmotic balance. Sodium deoxycholate inhibits the accompanying gram positive flora. Sodium thiosulfate increase the selectivity and the recovery of Cronobacter and Enterobacter species. 5-Bromo-4-chloro-3-indolyl a-D-glucopyranoside is the chromogenic substrate.
Cronobacter (formerly Enterobacter sakazakii) is currently considered and emerging pathogen responsible for severe meningitis and necrotic enterocolitis in un-weaned babies that can be the cause of mortality rate between 40-80%.

The pathogenicity of Cronobacter for un-weaned babies' makes it necessary to review the manufacturing process of the milk-based products specialized for babies, guaranteeing the absence of the bacteria in the final product
Additional prevention measures at a hospital include the sanitary hygiene of the prepared food; reducing the time between the preparation and its administration, to impede the multiplication of microorganisms.

Formula in g/L

Bacteriological agar	15	Ferric ammonium citrate	1
Sodium chloride	5	Sodium deoxycholate	0,25
Sodium thiosulfate	1	Yeast extract	3
Tryptic digest of casein	7	5-bromo-4-chloro-3-indolyl-alpha-D-glucopyranoside	0,15

Preparation

Suspend 32,4 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Sterilize in autoclave at 121 ºC for 15 minutes. Cool to 50 ºC, homogenize gently and dispense into Petri dishes in amounts of 15 ml.

Instructions for use

According to ISO 22964:
- Pre-enrich the test portion in a non-selective medium such as Buffered Peptone Water BPW (Cat. 1402).
- Incubate at a temperature of 34-38 °C for 18±2 h.
- Inoculate the culture obtained in BPW in a selective medium of enrichment: Selective Broth for Cronobacter (CSB) (Cat. 2143).
- Incubate at a temperature of 41,5±1 °C for 24±2 h.

- Sow and identify the colonies in the Chromogenic Cronobacter Isolation Agar (CCI) (Cat. 1446).
- Incubate at a temperature of 41,5±1 °C for 24±2 h.
- For confirmation, typical colonies are selected from chromogenic agar, purified on a non-selective agar such as TSA (Cat. 1068) and characterized biochemically.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Slightly amber	7,3±0,2

Microbiological test

Incubation conditions: (41,5±1 ºC / 24±2 h).
Inoculation conditions: Productivity quantitative (100±20. Min. 50 CFU) / Selectivity (10^4-10^6 CFU) / Specificity (10^3-10^4 CFU).

Microorganisms	Specification	Characteristic reaction
Enterobacter cloacae ATCC 13047	Growth (1-2)	The colonies do not have green or greenish-blue color.
Staphylococcus aureus ATCC 25923	Total inhibition (0)	
Cronobacter sakazakii ATCC 29544	Good growth (2)	Blue-green colonies of small to medium size (1-3 mm)
Cronobacter muytjensii ATCC 51329	Good growth (2)	Blue-green colonies of small to medium size (1-3 mm)

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

E. coli O157:H7 Cromogenic Agar Base

Cat. 1588

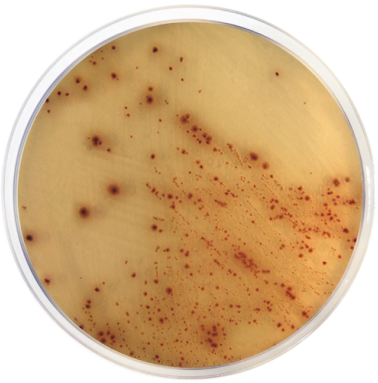
Selective and differential medium for the detection of E.coli O157:H7.

Practical information

Aplications	Categories
Detection	Escherichia coli O157

Industry: Clinical

CE IVD



Principles and uses

E. coli O157:H7 Cromogenic Agar Base is used for the detection of E.coli O157:H7.

E. coli O157:H7 has become a widespread public health issue as it is responsible for hemorrhagic colitis, characterized by a bleeding diarrhea with acute abdominal pain. E.coli O157:H7 produce several cytotoxins, neurotoxins, and enterotoxins, including Shiga toxin. Incorrect antibiotic treatment may increase the risk of haemolytic uraemic syndrome development, a potentially fatal complication of this form of colitis.

E. coli O157:H7 has a bovine reservoir, infection can occur after ingestion of undercooked beef or unpasteurized milk. The organism can also be transmitted by the fecal-oral route.

Peptone Mixture provides nitrogen, vitamins, minerals and amino acids essential for growth. Chromogenic mixture allows to easily detect the presence of E.coli O157:H7 by colony coloration that grows pale pink. Potassium tellurite and cefixime are highly selective for E. coli O157:H7 and inhibit most contaminating bacteria including other E.coli strains and coliforms. Bacteriological agar is the solidifying agent.

Formula in g/L

Bacteriological agar	15	Chromogenic mixture	2,8
Peptone mixture	20		

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 18,9 grams of the medium in 500 ml of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Sterilize in autoclave at 121 ºC for 10 minutes. Cool to 45-50 ºC and aseptically add one vial of the Cefixime Tellurite Supplement (Cat. 6064). Homogenize gently and dispense into Petri dishes.

Instructions for use

For clinical diagnosis, the type of sample is feces.
- Inoculate on the surface making parallel grooves with the handle or swab.
- Incubate in aerobic conditions at 35±2 °C for 18-24 hours.
- Reading and interpretation of the results.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)

w/o rests	Fine powder	Beige	Amber, slightly opalescent	7,1±0,2

Microbiological test

Inoculation conditions: (35±2 ºC / 18-24 h).

Microorganisms	Specification	Characteristic reaction
Klebsiella aerogenes ATCC 13048	Total inhibition	
Salmonella typhimurium ATCC 14028	Total inhibition	
Enterococcus faecalis ATCC 19433	Total inhibition	
Escherichia coli ATCC 25922	Total inhibition	
Staphylococcus aureus ATCC 25923	Inhibición total	
Escherichia coli 0157:H7 ATCC 43895	Good growth	Pale pink colonies
Escherichia coli ATCC 8739	Total inhibition	

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

E. coli-Coliforms Chromogenic Agar Base (BOE)

Cat. 1491

Selective medium for the simultaneous detection of E.coli and other coliforms in water and food samples.

Practical information

Aplications	Categories
Detection	Coliforms
Detection	Escherichia coli

Industry: Water / Food

Principles and uses

E. coli-Coliforms Chromogenic Agar Base is a selective medium for the detection of E.coli and other coliforms in waters and foods. The recovery and enumeration of Escherichia coli and coliforms are important indicators of environmental and food hygiene.

The interaction of ingredients in the medium, such as peptone, sorbitol and pyruvate, grants a quick colony growth, including infectious coliforms and also permits the recovery of sublethal thermally injured coliforms. Tergitol-7 inhibits Gram positive bacteria and some Gram negative without affecting the coliform bacteria. Selectivity is enhanced by the Cefsulodine and Vancomycin, supplied by the Supplement E. coli-Coliformes (Cat. 6041), act against pseudomonas and Gram negative, oxidase positive bacteria, enterococci and other Gram positive bacteria. Sodium chloride maintains the osmotic balance and phosphate salts act as a buffer system. Bacteriological agar is the solidifying agent.

Detection of ß-glucuronidase is widely used to differentiate Escherichia coli, as the enzyme is present in E. coli but not in other member of coliform group. The chromogenic mixture contains chromogenic substrates: Salmon-GAL and X-glucuronide. Coliform enzymes produced, ß-D-galactosidase and ß-D-glucuronidase, cleave these substrates resulting in the different coloration of bacteria colonies. The ß-D-galactosidase cleaves Salmon-GAL substrate, and gives a salmon-red color to the coliform colonies. The ß-D-glucuronidase, enzyme characteristic of E. coli, cleaves X-glucuronide, giving a blue color to these colonies. E. coli has the two enzymes and cleaves both chromogenic substances giving dark blue to violet colonies. Total coliforms are the sum of E. coli colonies plus salmon-red colonies. The addition of tryptophan to the medium allows the performance of the Indole test for further E. coli confirmation.

Note: Some Shigella strains contains the enzyme ß-D-glucuronidase and can grow aslight blue colonies. The negative E. coli b-ß-glucuronidase colonies are Salmon, e.g. E. coli O157:H7.

Formula in g/L

Bacteriological agar	10	Casein peptone	3
Sodium chloride	5	Sodium dihidrogenphosphate	2,2
Sodium pyruvate	1	Sorbitol	1
Tryptophan	1	Di-sodium hydrogen phosphate	2,7
Salmon GAL	0,2	X-Glucuronide	0,2
Tergitol 7	0,15		

Preparation

Suspend 13,25 grams of the medium in 500 ml of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. AVOID OVERHEATING. DO NOT AUTOCLAVE. Cool to 45-50 ºC and aseptically add one vial of the E.coli-coliforms Supplement (Cat. 6041). Homogenize gently and dispense into Petri dishes.

Instructions for use

The following techniques may be used:

Spread plate method (Digralsky):
- In a Petri dish, add 12-15 ml of molten agar and let it solidify.
- Inoculate 0,1 ml of the initial suspension and/or diluted sample.
- Extend the inoculum with a sterile loop on the agar surface.
- Incubate the plates in an inverted position at a temperature of 36±2 ºC for 18-24 hours.

Poured plate method:
- Deposit 1 ml of the initial suspension and/or diluted sample in an empty Petri dish.
- Add 12-15 ml of agar cooled to 45 ºC in each Petri dish and mix gently moving the plate.
- Allow the plates to solidify and incubate in an inverted position at a temperature of 36±2 ºC for 18-24 hours.

Filter membrane method:
- Dry the surface of the prepared plates.
- Filter an appropriate volume of the sample through the membrane.
- Place the membrane on the surface of the agar plate, avoiding the formation of air bubbles.
- Invert the plates and incubate at 36±2 ºC for 18-24 hours.

Incubate until 24 hours to observe possible retarded ß-Galactosidase and ß-Glucurinidase reactions.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber	6,8±0,2

Microbiological test

Incubation conditions: (36±2 ºC / 18-24 h).

Microorganisms	Specification	Characteristic reaction
Salmonella enteritidis ATCC 13076	Good growth	Colorless colonies
Enterococcus faecalis ATCC 19433	Total inhibition	
Escherichia coli ATCC 25922	Good growth	Blue-dark violet colonies
Citrobacter freundii ATCC 8090	Good growth	Salmon colonies
Escherichia coli ATCC 8739	Good growth	Blue-dark violet colonies

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

E. coli-Coliforms Chromogenic Medium

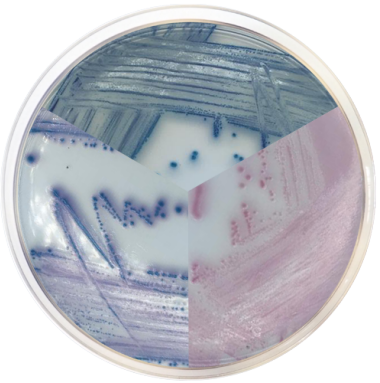
Cat. 1340

Selective medium for the simultaneous detection of E.coli and other coliforms in water and food samples

Practical information

Aplications	Categories
Detection	Coliforms

Industry: Water / Food



Principles and uses

E. coli-Coliforms Chromogenic Medium is a selective media for the detection of E.coli and other coliforms in waters and foods. The recovery and enumeration of Escherichia coli and coliforms are important indicators of environmental and food hygiene.

The interaction of ingredients in the medium, such as peptone, sorbitol and pyruvate, grants a quick colony growth, including infectious coliforms and also permits the recovery of sublethal thermally injured coliforms. Tergitol-7 inhibits Gram positive bacteria and some Gram negative without affecting the coliform bacteria. Sodium chloride maintains the osmotic balance and phosphate salts act as a buffer system. Bacteriological agar is the solidifying agent.

Detection of ß-glucuronidase is widely used to differentiate Escherichia coli, as the enzyme is present in E. coli but not in other member of coliform group. The chromogenic mixture contains chromogenic substrates: Salmon-GAL and X-glucuronide. Coliform enzymes produced, ß-D-galactosidase and ß-D-glucuronidase, cleave these substrates resulting in the different coloration of bacteria colonies. The ß-D-galactosidase cleaves Salmon-GAL substrate, and gives a salmon-red color to the coliform colonies. The ß-D-glucuronidase, enzyme characteristic of E. coli, cleaves X-glucuronide, giving a blue color to these colonies. E. coli has the two enzymes and cleaves both chromogenic substances giving dark blue to violet colonies. Total coliforms are the sum of E. coli colonies plus salmon-red colonies. The addition of tryptophan to the medium allows the performance of the Indole test for further E. coli confirmation.

Note: Some Shigella strains contains the enzyme ß-D-glucuronidase and can grow aslight blue colonies. The negative E. coli b-ß-glucuronidase colonies are Salmon, e.g. E. coli O157:H7.

Formula in g/L

Bacteriological agar	10	Bacteriological peptone	3
Chromogenic mixture	0,36	Sodium chloride	5
Sodium pyruvate	1	Sorbitol	1
Tergitol® 15-S-7 surfactant	0,1	Tryptophan	1
Phosphate buffer	4,9		

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 26,4 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. AVOID OVERHEATING. DO NOT AUTOCLAVE. Allow to cool at 45-50 ºC and dispense in Petri dishes.

Instructions for use

Pour plate technique:

- Deposit 1 ml of the initial suspension and/or diluted sample in an empty Petri dish.
- Add 12-15 ml per plate of agar cooled to 44 - 47ºC in each Petri dish.
- Invert the plates and incubate at 35±2 ºC for 18-24 hours.

Surface plating technique:
- Inoculate 0,1 ml of the initial suspension and/or diluted sample.
- Spread the inoculum on the surface of the agar plate.
- Invert the plates and incubate at 35±2 ºC for 18-24 hours.

Filter-membrane technique:
- Filter an appropriate volume of sample through the membrane.
- Place the membrane onto the surface of an agar plate, avoiding the formation of air bubbles.
- Invert the plates and incubate at 35±2 ºC for 18-24 hours.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber	6,8±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 18-24 h)

Microorganisms	Specification	Characteristic reaction
Salmonella enteritidis ATCC 13076	Good growth	Colorless colony
Enterococcus faecalis ATCC 19433	Inhibited growth	
Escherichia coli ATCC 25922	Good growth	Blue-dark violet colony
Citrobacter freundii ATCC 8090	Good growth	Salmon colony
Escherichia coli ATCC 8739	Good growth	Blue-dark violet colony

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

E. coli-Enterobacteria Chromogenic Agar

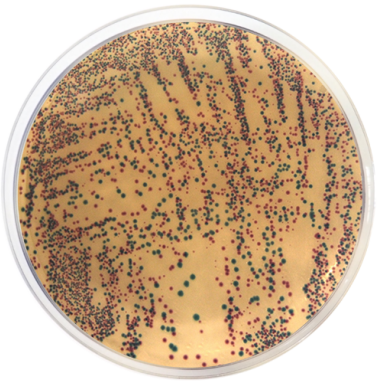
Cat. 2018

For the differentiation of E.coli and Enterobacteria in foods.

Practical information

Aplications	Categories
Differentiation	Enterobacteria
Differentiation	Escherichia coli

Industry: Food



Principles and uses

E. coli-Enterobacteria Chromogenic Agar is used for the differentiation of E.coli from the rest of Enterobacteria. In the same plate it is able to enumerate E. coli and enterobacteria.

The medium can be inoculated directly with a loop.E.coli is easily distinguishable due to the dark blue-greenish blue colony color. Enterobacteria will growth as magenta colonies. The rest of bacteria are inhibited, and in case of growing, they will grow as colorless colonies.

Note: Some Shigella strains contain the same enzyme as E. coli and can grow as light blue colonies. E.coli O157:H7 do not contain the enzyme to produce blue colonies and will growh magenta.

Formula in g/L

Bacteriological agar	14	Chromogenic mixture	0,5
Nutrients	16		

Preparation

Suspend 30,5 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution AVOID OVERHEATING. DO NOT AUTOCLAVE. Cool to 45-50 ºC, mix well and dispense into plates.

Instructions for use

Inoculate and incubate at 35±2 ºC for 18-24 hours.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber, slightly opalescent	7,1±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 18-24 h).

Microorganisms	Specification	Characteristic reaction

Shigella flexneri ATCC 12022	Good growth	Pink colonies
Salmonella enteritidis ATCC 13076	Good growth	Pink colonies
Salmonella typhimurium ATCC 14028	Good growth	Pink colonies
Escherichia coli ATCC 25922	Good growth	Dark blue-greenish blue colonies
Enterococcus faecalis ATCC 29212	Total inhibition	
Staphylococcus aureus ATCC 6538	Total inhibition	
Salmonella typhi ATCC 6539	Good growth	Pink colonies
Escherichia coli ATCC 8739	Good growth	Dark blue-greenish blue colonies

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

EC with MUG Fluorogenic Agar

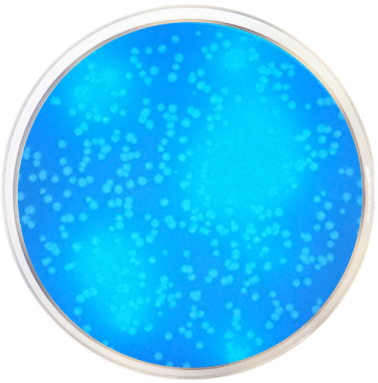
Cat. 1180

For quick detection of Escherichia coli in water, food and milk.

Practical information

Aplications	Categories
Detection	Escherichia coli

Industry: Water / Food



Principles and uses

EC with MUG Fluorogenic Agar is the same formula as EC Medium with the addition of 4 methylumbelliferyl- ß-D-glucuronide (MUG) recommended for the membrane-filter technique for detection of E. coli.

Water pollution caused by faecal contamination is a serious problem due to the potential for contracting diseases from pathogens (disease causing organisms).

This medium improves the detection methods of the coliform group, in particular of E. coli, and is used to investigate drinking water, wastewater treatment systems and generally for water-quality monitoring, as well as shellfish and other foods. The medium can be used at 35±2 ºC for detection of coliform organisms or at 44,5 ºC for isolation of E. coli.

The Bile salts act as selective agent inhibiting Gram-positive bacteria, bacilli and enterococci but allowing E. coli to develop. The Potassium salts have a high buffering capacity. Tryptose provides the nutrients for growth and Lactose is the fermentable carbohydrate as carbon and energy source. Sodium chloride maintains the osmotic balance. Bacteriological Agar is the solidifying agent.

E. coli produces enzyme ß-D-glucuronidase that hydrolyzes MUG to yield a fluorogenic product that is detectable under long-wave (366 nm) UV light.

Formula in g/L

Bacteriological agar	12	Bile salts N° 3	1,5
Disodium phosphate	5	Monopotassium phosphate	1,5
Sodium chloride	5	Tryptone	20
Yeast extract	5	MUG (4-methylumbelliferyl-ß-D-glucuronide)	0,1

Preparation

Suspend 50 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Sterilize in autoclave at 121 ºC for 15 minutes.

Instructions for use

- Filtration of a test portion of the sample throught a membrane filter which retains the organisms, and placement of the membrane filter on a EC with MUG Fluorogenic Agar plate.
- Incubation at 37±2 ºC for 24-48 hours.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber, slightly opalescent	7,2±0,2

Microbiological test

Incubation conditions: (37±2 ºC / 24-48 h).

Microorganisms	Specification	Characteristic reaction
Enterococcus faecalis ATCC 19433	Partial inhibition	Fluorescence (-)
Escherichia coli ATCC 25922	Good growth	Fluorescence (+)
Citrobacter freundii ATCC 43864	Good growth	Fluorescence (-)

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

EC with MUG Fluorogenic Broth

Cat. 1285

For quick detection of Escherichia coli in water, food, milk and other appliactions.

Practical information

Aplications	Categories
Selective isolation	Coliforms
Selective isolation	Escherichia coli
Detection	Coliforms
Detection	Escherichia coli

Industry: Water

Principles and uses

EC with MUG Fluorogenic Broth is a medium recommended for the detection of E. coli using the membrane filtration technique.

Faecal contamination of water is a serious problem due to the possibility of contracting diseases from pathogens (disease-causing organisms). This medium allows a better detection of coliform organisms, in particular of E. coli, and is used to investigate drinking water, wastewater treatment systems and generally for water-quality monitoring, as well as shellfish and other foods.

The medium can be incubated at 35±2 ºC for the detection of coliform organisms or at 44,5 ºC for the isolation of E. coli.

The bile salts act as selective agent inhibiting Gram-positive bacteria, bacilli and enterococci but allowing E. coli to develop. The potassium salts have a high buffering capacity. Tryptose provides the nutrients for growth and lactose is the fermentable carbohydrate as carbon and energy source. Sodium chloride maintains the osmotic balance.

E. coli contauns the enzyme ß-D-glucuronidase that hydrolyzes MUG to yield a fluorogenic product that is detectable under long-wave (366 nm) UV light. The addition of MUG to EC Broth provides another criterion, in addition to growth response and gas production, to determine the presence of E. coli in food and environmental samples.

Formula in g/L

Bile salts N° 3	1,9	Dipotassium phosphate	4
Lactose	5	Monopotassium phosphate	1,5
Sodium chloride	5	Tryptose	20
MUG (4-methylumbelliferyl-ß-D-glucuronide)	0,1		

Preparation

Suspend 37,5 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. DO NOT AUTOCLAVE. Dispense into appropriate containers with Durham bells to test the lactose fermentation.

Instructions for use

Inoculate and incubate at a temperature of 37±2 ºC and observe after 24-48 hours under UV light.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber	6,9±0,2

Microbiological test

Incubation conditions: (37±2 ºC / 24-48 h).

Microorganisms	Specification	Characteristic reaction
Enterococcus faecalis ATCC 19433	Partially inhibited	Fluorescence (-), Gas (+)
Escherichia coli ATCC 25922	Good growth	Fluorescence (+), Gas (+)
Citrobacter freundii ATCC 43864	Good growth	Fluorescence (-), Gas (+)

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

ESBL Chromogenic Agar

Cat. 2062

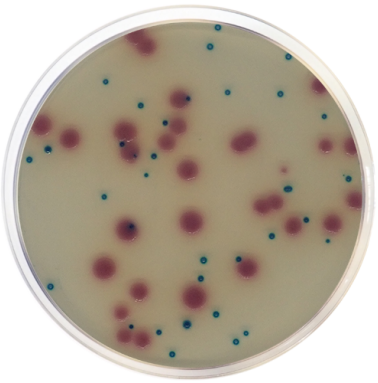
Chromogenic medium for overnight detection of gram-negative bacteria producing Extended Spectrum Beta-Lactamase.

Practical information

Aplications	Categories
Detection	ESBL Bacteria

Industry: Clinical

CE
IVD



Principles and uses

ESBL (Extended Spectrum ß-Lactamases)is a Chromogenic medium for the detection of gram-negative bacteria producing Extended Spectrum Beta-Lactamase.

ESBL (Extended Spectrum ß-Lactamases) are enzymes capable of hydrolyzing penicillins, broad-spectrum cephalosporins and monobactams, ESBLs are often located on plasmids that are transferable from strain to strain and between bacterial species. ESBL-producing Enterobacteriae were first identified in Germany in 1983, and now they are widely recognized as clinically relevant causes of infections in community. During the 1990s were mostly found in Klebsiella species. However E. coli ESBL-producing has also been widely detected and both have a significant importance in hospital acquired infections. Community-acquired urinary tract infection (CA-UTI) is the most common infection caused by extended-spectrum ß-lactamase (ESBL)-producing Enterobacteriaceae and it is a big concern in management of patients and hospital costs. The development and spread of ESBL among Gram-negative bacteria and possible horizontal transfer calls for concern, especially in view of treatment failure, high treatment cost, and consequent discomfort to patients. The early detection of ESBL-producing bacteria carriers is essential to minimize their impact and spread.

Peptones and growth factors provide nitrogen, vitamins, minerals and aminoacids essential for growth. Chromogenic mixture allows the identification of ESBL producing microorganisms. The supplement inhibits the growth of all the non ESBL-producing bacteria.

Characteristics of the ESBL colonies:
- E. coli: pink colonies.
- Enterobacter aerogenes: dark blue colonies.
- Klebsiella pneumoniae: dark blue colonies.

Formula in g/L

Bacteriological agar	16	Chromogenic mixture	3
Peptone	14	Growth factors	15

Preparation

Suspend 48,0 grams of medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Sterilize in autoclave at 121 ºC for 15 minutes. Cool to 50 ºC and aseptically add two vials of ESBL supplement (Cat. 6042). Mix well and dispense into plates.

Instructions for use

For clinical diagnosis, the type of sample is urine, rectal sample and pulmonary aspiration.
- Inoculate on the surface making parallel striae with the handle or swab.
- Incubate in aerobic conditions at 35±2 ºC for 18-24 hours.

- Reading and interpretation of results.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber, slightly opalescent	7,2±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 18-24 h).

Microorganisms	Specification	Characteristic reaction
Klebsiella pneumonieae ATCC 13883	Total inhibition	
Enterococcus faecalis ATCC 19433	Partially inhibited	Light blue colonies
Escherichia coli ATCC 2469	Good growth	Pink colonies
Escherichia coli ATCC 25922	Total inhibition	
Staphylococcus aureus ATCC 25923	Total inhibition	
Proteus mirabilis ATCC 25933	Total inhibition	

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

Klebsiella Chromogenic Agar Base

Cat. 2119

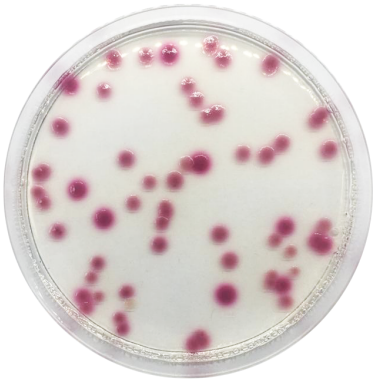
For the selective isolation of Klebsiella sp.

Practical information

Aplications	Categories
Selective isolation	Klebsiella

Industry: Clinical

CE IVD



Principles and uses

Klebsiella Chromogenic Agar Base is a selective medium for the isolation of Klebsiella. These Gram negative bacteria can cause different types of health-associated infections, including pneumonia, bloodstream infections, wounds or surgical infections and meningitis.

Klebsiella is usually found in human intestines (where it does not cause disease) and feces. Healthy people rarely suffer from Klebsiella infections, whereas in health centres they often occur in patients who are being treated. Patients requiring ventilation devices or intravenous catheters have a higher risk of contracting this type of infection.

Casein peptone is a source of nitrogen, vitamins and amino acids essential for growth. Sorbitol is the fermentable carbohydrate providing carbon and energy. The buffering capacity is provided by the disodium phosphate and monosodium phosphate. Sodium chloride maintains the osmotic equilibrium of the medium. Chromogenic mixture incorporated in the media is cleaved specifically by Klebsiella species to produce pink colonies. Tryptophan promotes the indole reaction when adding Kovac's reagent to detect the capability of the microorganism to cleave tryptophan. Agar is the solidifying agent.

Formula in g/L

Bacteriological agar	10	Casein peptone	3
Chromogenic mixture	0,22	Disodium phosphate	2,7
Sodium chloride	5	Sodium pyruvate	1
Sorbitol	1	Tryptophan	1
Monosodium Phosphate	2,2		

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 13,06 grams of the medium in 500 ml of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. AVOID OVERHEATING. DO NOT AUTOCLAVE. Cool to 45-50 ºC and add the Klebsiella Selective Supplement (Cat. 6045). Mix well and pour into Petri dishes.

Instructions for use

» For clinical diagnosis, the type of sample is any sample of clinical origin.

The collection, handling and processing of the samples are carried out according to the recommendations and standards in Clinical Microbiology.
- Inoculate on surface making paralell striae with the handle or swab.
- Incubate at 35±2 ºC for 24-48 hours.
- Reading and interpretation of the results.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Light beige	Clear amber, slightly opalescent	6,8±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 24-48 h).

Microorganisms	Specification	Characteristic reaction
Klebsiella aerogenes ATCC 13048	Inhibited growth	
Klebsiella oxytoca ATCC 13182	Good growth	Pink colony
Klebsiella pneumonieae ATCC 13883	Good growth	Pink colony
Salmonella typhimurium ATCC 14028	Inhibited growth	
Klebsiella BAA 1705	Good growth	Pink colony
Escherichia coli ATCC 25922	Inhibited growth	
Staphylococcus aureus ATCC 25923	Inhibited growth	
Proteus mirabilis ATCC 25933	Inhibited growth	
Enterococcus faecalis ATCC 29212	Inhibited growth	
Citrobacter freundii ATCC 8090	Inhibited growth	
Pseudomonas aeruginosa ATCC 9027	Inhibited growth	

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

KPC Chromogenic Medium

Cat. 2063

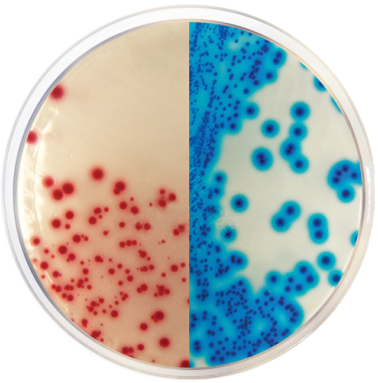
Chromogenic medium for detection of Gram-negative with reduced susceptibility to most of the carbapenem agents.

Practical information

Aplications	Categories
Detection	Bacteria resistant to carbapenems

Industry: Clinical

CE
IVD



Principles and uses

Klebsiella pneumoniae carbapenemase (KPC)-producing bacteria are a group of emerging highly drug-resistant Gram-negative bacilli causing infections associated with significant morbidity and mortality. Carbapenem antibiotics are generally not effective against KPC-producing organisms.

Although K. pneumoniae remains the most prevalent bacterial species carrying KPCs, the enzyme has been identified in several other gram-negative bacilli. Infections caused by bacteria-producing carbapenemases are becoming an increasingly significant problem worldwide because they are often not detected by routine susceptibility screening and possess an exceptional potential for dissemination. Infections caused by these organisms present clinicians with serious treatment challenges, due to limited antibiotic options.

Peptones and growth factors provide nitrogen, vitamins, minerals and amino acids essential for growth. Chromogenic mixture allows the identification of Gram-negative bacteria with a reduced susceptibility to the carbapenem agents. The supplement inhibits the growth of all the KPC non-producing bacteria.

Characteristics of KPC colonies:
- Escherichia coli: colonias pink.
- Enterobacter aerogenes: dark blue.
- Klebsiella pneumoniae: dark blue.

Formula in g/L

Bacteriological agar	16	Chromogenic mixture	3
Peptone	14	Growth factors	15

Preparation

Suspend 48,0 grams of medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Sterilize in autoclave at 121 ºC for 15 minutes. Cool to 50 ºC and aseptically add 1 g/L of Meropenem. Mix well and dispense into plates.

Instructions for use

For clinical diagnosis, the type of sample is urine, lung aspirations and rectal samples.

- Inoculate on the surface making parallel striae with the handle or hyssop.
- Incubate in aerobic conditions at 35±2 °C for 18-24 hours.
- Reading and interpretation of results.

Note: It’s important to notice that, as it happens in other chromogenic media, bacteria with atypical KPC enzyme may produce anomalous reactions in this medium.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber, slightly opalescent	7,2±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 18-24 h).

Microorganisms	Specification	Characteristic reaction
Klebsiella pneumonieae ATCC 13883	Total inhibition	
Klebsiella BAA 1705	Good growth	Blue colonies
Enterococcus faecalis ATCC 19433	Partial inhibition	Light blue colonies
Escherichia coli ATCC 2469	Good growth	Pink colonies
Escherichia coli ATCC 25922	Total inhibition	
Staphylococcus aureus ATCC 25923	Total inhibition	
Proteus mirabilis ATCC 25933	Total inhibition	

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

Lauryl Sulfate Chromogenic Broth

Cat. 1465

Enrichment medium for the simultaneous detection of total Coliforms and E. coli in water, foods and dairy products by the fluorogenic procedure.

Practical information

Aplications	Categories
Selective enumeration	Coliforms
Selective enumeration	Escherichia coli
Selective enrichment	Coliforms
Selective enrichment	Escherichia coli
Detection	Coliforms
Detection	Escherichia coli

Industry: Water / Food / Dairy products

Principles and uses

Lauryl Sulfate Chromogenic Broth allows the detection of total Coliform and E. coli count at the same time due to the Chromogenic-Fluorogenic Mix.

The combination of chromogenic compounds within Lauryl Sulfate Broth provide a double indicator system. This medium contains a phosphate buffer to ensure the high growth of the total number of Coliforms. Lauryl sulfate inhibits gram-positive bacteria. Coliforms and E. coli contain ß-galactosidase which cleaves the chromogenic substrate. The enzyme which cleaves MUG is highly specific to E. coli, making the simultaneous detection of total Coliforms and E. coli possible. IPTG stimulates the synthesis and increases the activity of ß-galactosidase.

The color change from amber to blue-greenish due to the reaction of the chromogenic substrate indicates the presence of coliforms. Blue fluorescence under UV light allows the rapid detection of E. coli due to the MUG.

Tryptophane promotes the indol reaction after adding Kovac's reagent (Cat. 5205). This reactive detects the microorganism capable of cleaving the tryptophane. When E. coli is present in the medium, indol is liberated and reacts with 4-dimethylaminobenzaldehyde to form a dark red dye.

Formula in g/L

Chromogenic-fluorogenic mix	0,23	Dipotassium phosphate	2,7
Monopotassium phosphate	2	Sodium chloride	5
Sodium lauryl sulfate	0,1	Sorbitol	1
Tryptophan	1	Tryptose	5

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 17 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Dispense into appropriate containers and sterilize in the autoclave at 121 ºC for 15 minutes.

Instructions for use

Inoculate and incubate at 35±2 ºC during 18-24 hours. Check the tubes under UV light (366 nm). Light blue fluorescence indicates the presence of E. coli.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)

w/o rests	Fine powder	Beige	Clear amber	6,8±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 18-24 h).

Microorganisms	Specification	Characteristic reaction
Shigella flexneri ATCC 12022	Good growth	Medium color without changes, Fluorescence (-)
Klebsiella aerogenes ATCC 13048	Good growth	Blue-greenish medium, Fluorescence (-), Indol (-)
Klebsiella pneumonieae ATCC 13883	Good growth	Blue-greenish medium, Fluorescence (-), Indol (-)
Salmonella typhimurium ATCC 14028	Good growth	Medium color without changes, Fluorescence (-)
Escherichia coli ATCC 25922	Good growth	Blue-greenish medium, Fluorescence (+), Indol (+)
Citrobacter freundii ATCC 8090	Good growth	Blue-greensih medium, Fluorescence (-)
Escherichia coli ATCC 8739	Good growth	Blue-greenish medium, Fluorescence (+), Indol (+)

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

Listeria Chromogenic Agar Base according to Ottaviani and Agosti (ALOA) ISO

Cat. 1345

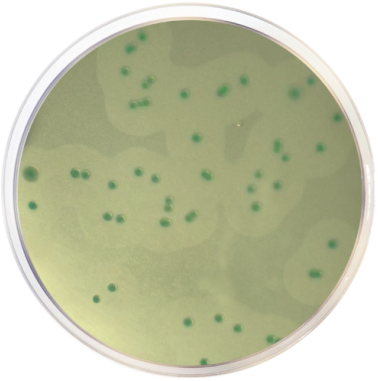
Selective medium for the detection and enumeration of Listeria monocytogenes.

Practical information

Aplications	Categories
Selective enumeration	Listeria
Detection	Listeria

Industry: Clinical / Food

Regulations: ISO 11133 / ISO 11290 / BAM



Principles and uses

Listeria Chromogenic Agar Base acc. to Ottaviani and Agosti (ALOA) is a selective medium for the presumptive isolation and identification of Listeria monocytogenes and Listeria spp. in food and clinical samples. It is used for confirmation after using Listeria Enrichment Broth Base Fraser (Cat. 1120). This medium is also recommended by ISO 11290-1 for the detection and enumeration for Listeria monocytogenes.

Enzymatic digest of animal tissues and enzymatic digest of casein provide nitrogen, vitamins, minerals and amino acids essential for growth. Yeast extract is the source of vitamins, particularly of the B-group. Sodium chloride supplies essential electrolytes for transport and osmotic balance. Sodium pyruvate is a source of energy for bacterial metabolism and aids in the resuscitation of stressed organisms. Glucose is the fermentable carbohydrate providing carbon and energy. Magnesium glycerophosphate is a buffering compound. Magnesium sulphate is a magnesium ion required for a large variety of enzymatic reactions, including DNA replication. The differential activity of the medium is due to two factors. Lithium chloride in the base medium and supplementary antimicrobial compounds Ceftazidime, Polymyxin, Nalidixic acid and Cycloheximide provide the medium's selectivity. Bacteriological agar is the solidifying agent.

The presence of the chromogenic component X-glucoside, a substrate for the detection of the enzyme ß-glucosidase, is common to all Listeria species giving the colonies their blue colour. Other organisms that possess this enzyme, for example, Enterococci, are inhibited by the selective agents within the medium and by the selective supplement. The differential activity is also obtained by lipase C substrate, upon which the specific enzyme for L. monocytogenes acts. The lipase is responsible for the opaque white halo which surrounds L. monocytogenes.

The combination of both substrates allows us to differentiate the colonies of Listeria monocytogenes from the rest of Listeria spp. since, although all are blue in colour, L. monocytogenes present an opaque white halo surrounding them.

It has been observed that some strains of Listeria ivanovii, mostly pathogenic to animals although some have caused infections in humans, also possess lipase activity.

Formula in g/L

Enzymatic digest of casein	6	Glucose	2
Bacteriological agar	13,5	Magnesium sulfate	0,5
Sodium chloride	5	Sodium hydrogen phosphate	2,5
Sodium pyruvate	2	Yeast extract	10
Enzymatic digest of animal tissues	18	Lithium chloride	10
Magnesium glycerophosphate	1	5-Bromo-4-chloro-3-indolyl-ß-D-glucopyranoside	0,05

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 35.275 grams of the medium in 470 ml of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until

complete dissolution. Sterilize in autoclave at 121 ºC for 15 minutes. To prepare more quantity of 500 ml, it is recommended to sterilize at 115 ºC for 10 minutes. Cool to 47-50 ºC and aseptically add one bottle of Listeria Lipase C Supplement (24 ml) (Cat. 6031) and one vial of Listeria Chromogenic Selective Supplement (Cat. 6040). Homogenize gently and dispense into Petri dishes.

Instructions for use

Dection and enumeration of Listeria monocytogenes and Listeria spp. according to ISO 11290:

Detection method:
- Weigh 25 g (or 25 ml) of the sample and add 225 ml of Half Fraser Broth (Cat.1183). Homogenize and incubate at 30 °C for 25±1 hours.
- Inoculate 0,1 ml of incubated Half Fraser Broth culture (regardless of its colour) into 10 ml of Fraser Broth (Cat.1182).
Incubate at 37 ºC for 24±2 hours in aerobic conditions.
- From the primary enrichment culture inoculate the surface of the Agar Listeria according to Ottaviani and Agosti and the other selective medium at the choice of the laboratory, to obtain well-separated colonies.
From the secondary enrichment culture, repeat the procedure, inoculate the surface of the Agar Listeria according to Ottaviani and Agosti and the other selective medium.
For Agar Listeria according to Ottaviani and Agosti incubate for a total of 48±2 h.
- Select the presumptive colonies and carry out the confirmation tests for L. monocytogenes or Listeria spp.

Enumeration method:
- Prepare an initial suspension 1:10 of sample and Buffered Peptone Water for analysis. Listeria 1/2 Fraser Broth (Cat. 1183) can be used as a diluent if the detection and enumeration procedures are carried out simultaneously.
- Inoculate 0,1 ml on the surface of Listeria Chromogenic Agar according to Ottaviani and Agosti.
- Incubate at 37 ºC for 24 ± 2 h. Incubate for an additional 24 hours in case no microbial growth is detected.
- Select the presumptive colonies and carry out confirmation tests for L. monocytogenes or Listeria spp.
- Calculate from the confirmed colonies the number of L. monocytogenes or Listeria spp colonies.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber slightly opalescent	7,2 ± 0,2

Microbiological test

According to ISO 11133:
Incubation conditions: Productivity, Selectivity and Specificity (37±1 ºC / 48±4 h).
Inoculation conditions: Productivity quantitative (100±20. Min.50 CFU) / Productivity qualitative (10^3-10^4 CFU) / Selectivity (10^4-10^6 CFU) / Specificity (10^3-10^4 CFU).
Reference media: TSA

Microorganisms	Specification	Characteristic reaction
Listeria monocytogenes 4b ATCC 13932	Good growth (2) >50%	Blue green colonies with opaque halo
Enterococcus faecalis ATCC 29212	Total inhibition (0)	
Listeria innocua ATCC 33090		Blue green colonies without opaque halo
Listeria monocytogenes 1/2a ATCC 35152	Good growth (2) >50%	Blue green colonies with opaque halo
Escherichia coli ATCC 8739	Total inhibition (0)	

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

M-EI Chromogenic Agar Base

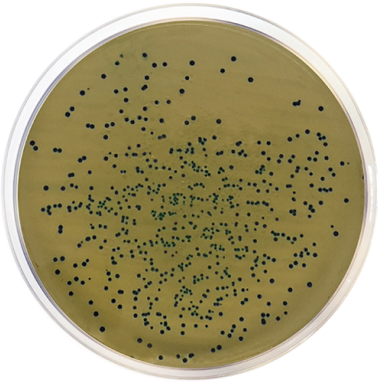
Cat. 1412

For the detection and enumeration of Enterococcus in water through the single step membrane filtration technique

Practical information

Aplications	Categories
Selective enumeration	Enterococci
Detection	Enterococci

Industry: Water



Principles and uses

m-EI Chromogenic Agar Base is recommended for the detection and enumeration of enterococci in water by the membrane filter technique.

The medium was developed as a single-step procedure that does not require the transfer of the membrane filter to another substrate. Observation of blue color colonies confirms the presence of enterococci.

A wide range of sample volumes or dilutions can be tested by this single-step membrane filtration procedure for the detection and enumeration of enterococci in potable, fresh, estuarine, marine and shellfish-growing waters.

Peptone provides nitrogen, vitamins, minerals and amino acids essential for growth. Yeast extract provides trace elements, vitamins and amino acids. Esculin is hydrolyzed by enterococci to form esculetin and dextrose. Cycloheximide inhibits most fungi, and the sodium azide inhibits Gram negative bacteria. X-Glucoside is the substrate of the glucosidase-positive enterococci and the agar is added into the medium as a solidifying agent.

Formula in g/L

Bacteriological agar	15	Cycloheximide	0,05
Esculin	1	Peptone	10
Sodium azide	0,15	Sodium chloride	15
Yeast extract	30	X-Glucoside	0,75

Preparation

Suspend 71,95 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Sterilize in autoclave at 121ºC for 15 minutes. Cool to 50ºC, mix well and dispense into plates. For a more selective medium, prepare a solution of 0.24 grams of nalidixic acid in 5 ml of sterile distilled water with a few drops of sodium hydroxide 0.1N (for a better dissolution), and aseptically add to one liter of medium. If desired, 15 ml per liter of a 1% TTC solution can be added.

Instructions for use

Inoculate and incubate to 41±0,5 °C and observe alter 18-24 hours. Enterococcus species will growth as blue colonies. If TTc is added, then the colonies will grow red.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)

Sin restos	Polvo fino	Beige	Amber, slightly opalescent	7,1 ± 0,2

Microbiological test

Incubation conditions: (41±0,5 ºC / 18-24 h)

Microrganisms	Specification	Characteristic reaction
Enterococcus faecalis ATCC 19433	Good growth	Blue colonies
Escherichia coli ATCC 25922	Total inhibition	
Enterococcus faecium ATCC 6057	Good growth	Blue colonies

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

m-EI Chromogenic Agar Base, Modified

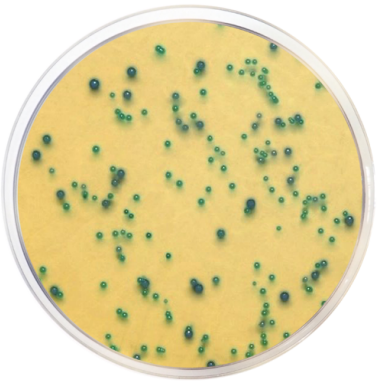
Cat. 2050

For the isolation and differentiation of Enterococcus faecalis and E. faecium.

Practical information

Aplications	Categories
Selective isolation	Enterococci
Differentiation	Enterococci

Industry: Clinical



Principles and uses

m-EI Chromogenic Agar Base, Modified is recommended for the isolation and differentiation of Enterococcus faecium and Enterococcus faecalis.

This medium is a modification of the m-EI cromogenic Agar base, where another chromogenic substrate is added. This addition allows the differentiation of Enterococcus faecium and Enterococcus faecalis.

Peptone provides nitrogen, vitamins, minerals and amino acids essential for growth. Yeast extract provides trace elements, vitamins and amino acids. Esculin is hydrolyzed by enterococci to form esculetin and dextrose. Cycloheximide inhibits most fungi, and the sodium azide inhibits Gram negative bacteria. Chromogenic Mix is added to differentiate Enterococcus faecium from Enterococcus faecalis. Bacteriological agar is the solidifying agent.

Formula in g/L

Bacteriological agar	15	Chromogenic mixture	0,2
Cycloheximide	0,05	Esculin	1
Peptone	10	Sodium azide	0,15
Sodium chloride	15	Yeast extract	30

Preparation

Suspend 71,48 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Sterilize in autoclave at 121 ºC for 15 minutes. Cool to 50 ºC, mix well and dispense into plates. For a more selective medium, prepare a solution of 0,24 grams of nalidixic acid in 5 ml of sterile distilled water with a few drops of sodium hydroxide 0,1N (for a better dissolution), and aseptically add to one liter of medium.

Caution: This medium contains sodium azide and cycloheximide and it is very toxic if swallowed, inhaled or comes into contact with skin. Wear gloves and eye face protection.

Instructions for use

Inoculate and incubate to 41±0,5 °C and observe alter 18-24 hours.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)

Sin restos	Fine powder	Beige	Amber, slightly opalescent	7,1±0,2

Microbiological test

Incubation conditions: (41±0,5 ºC / 18-24 h).

Microorganisms	Specification	Characteristic reaction
Enterococcus faecalis ATCC 19433	Good growth	Greenish blue colonies
Enterococcus faecium ATCC 19434	Good growth	Intense blue colonies
Escherichia coli ATCC 25922	Total inhibition	
Enterococcus faecalis ATCC 29212	Good growth	Greenish blue colonies
Enterococcus faecium ATCC 6057	Goog growth	Intense blue colonies

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

MRSA Chromogenic Agar Base

Cat. 1423

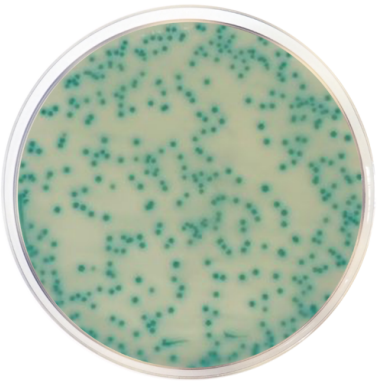
For the detection of methillin resistant Staphylococcus aureus from clinical samples.

Practical information

Aplications	Categories
Detection	Staphylococcus

Industry: Clinical

CE
IVD



Principles and uses

MRSA Chromogenic Agar Base is a chromogenic, selective and differential medium for detection of methicillin resistant Staphylococcus aureus.

Methicillin resistant Staphylococcus aureus, MRSA, are of particular interest at an international level due to its virulence and resistance to multiple antibiotics. The antimicrobial resistance is a serious threat to public health as it is now regarded as a major hospital acquired disease worldwide. The important changes observed in the epidemiological and microbiological characteristics of the infections caused by Staphylococcus aureus are the reason for the increment and prevalence of methicilin-resitant Staphylococcus aureus nosocomial (associated to hopitalized patients) and the proliferation of methicilin-resistent Staphylococcus aureus acquired by the community. The MRSA continues being a serious problem in many healthcare centres; more than 50% of the Staphylococcus aureus obtained are from Intensive Care Units (ICU) and close to 40% are from hospital patients. Effective, rapid laboratory diagnosis and susceptibility testing is critical in treating, managing and preventing MRSA infections.

This chromogenic media has been designed and is adequate for the screening of Staphylococcus aureus resistant to methicillin. The alpha-glucosidase produced by Staphylococcus aureus cleaves the chromogenic substrate and gives a blue color to the Staphylococcus aureus colony. The cefoxitin inhibits the growth of Staphylococcus aureus sensitive to methicillin.

Formula in g/L

Bacteriological agar	12,5	Peptone mixture	11
Growth factors	78	Chromogenic Substrate	1,9

Preparation

Suspend 51,7 grams of the medium in 500 ml of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. AVOID OVERHEATING. Sterilize in autoclave at 121 ºC for 15 minutes. Cool to 45-50 ºC and aseptically add one vial of Cefoxitin Supplement (Cat. 6069). Homogenize gently and dispense into Petri dishes.

Instructions for use

For clinical diagnosis, use any type of clinical sample.
- Inoculate on the surface. Parallel striae with the handle or swab.
- Incubate plates aerobically at 35±2 °C for 24-48 hours.
- Reading and interpretation of the results.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)

w/o rests	Fine powder	Grey straw	Amber, slightly opalescent	7,2±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 24-48 h).

Microorganisms	Specification	Characteristic reaction
Escherichia coli ATCC 25922	Inhibited growth	
Staphylococcus aureus ATCC 25923	Inhibited growth	
Staphylococcus aureus ATCC 43300	Good growth	Colony color Blue

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

MRSA Chromogenic Modified Agar Base

Cat. 1498

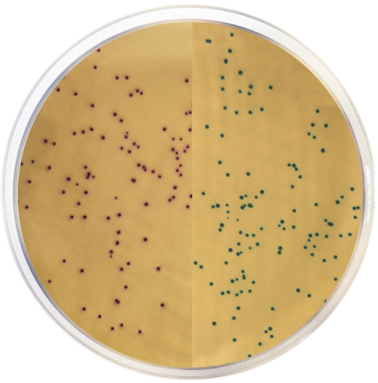
For the detection and differentiation of methicillin resistant Staphylococcus aureus and Staphylococcus epidermidis.

Practical information

Aplications	Categories
Detection	Staphylococcus
Differentiation	Staphylococcus

Industry: Clinical

CE
IVD



Principles and uses

MRSA Chromogenic Modified Agar Base is a chromogenic medium for the detection and differentiation of methicillin resistant Staphylococcus aureus and Staphylococcus epidermidis.

Methicillin resistant Staphylococcus aureus, MRSA, are of particular interest at an international level due to its virulence and resistance to multiple antibiotics. The antimicrobial resistance is a serious threat to public health as it is now regarded as a major hospital acquired disease worldwide. The important changes observed in the epidemiological and microbiological characteristics of the infections caused by Staphylococcus aureus are the reason for the increment and prevalence of methicilin-resistant Staphylococcus aureus nosocomial (associated to hospitalized patients) and the proliferation of methicilin-resistant Staphylococcus aureus acquired by the community. The MRSA continues being a serious problem in many healthcare centres; more than 50% of the Staphylococcus aureus obtained are from Intensive Care Units (ICU) and close to 40% are from hospital patients. Effective, rapid laboratory diagnosis and susceptibility testing is critical in treating, managing and preventing MRSA infections.

Methicillin resistant Staphylococcus aureus grow as magenta colonies. Methicillin resistant Staphylococcus epidermidis grow as green-blue colonies. The rest of the accompanying flora is inhibited. The cefoxitin inhibits the growth of Staphylococcus aureus sensitive to methicillin.

Formula in g/L

Bacteriological agar	12,5	Chromogenic mixture	0,24
Peptone mixture	41	Growth factors	56

Preparation

Suspend 110 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. AVOID OVERHEATING. DO NOT AUTOCLAVE. Cool to 45-50 ºC and aseptically add two vials of Cefoxitin MRSA Supplement (Cat. 6069). Homogenize gently and dispense into Petri dishes.

Instructions for use

For clinical diagnosis, use any type of clinical samples.
- Inoculate on the surface. Parallel striae with the handle or swab.
- Incubate plates aerobically at 35±2 ºC for 24-48 hours.
- Reading and interpretation of the results.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Grey straw	Amber, slightly opalescent	7,0±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 24-48 h).

Microorganisms	Specification	Characteristic reaction
Escherichia coli ATCC 25922	Inhibited growth	
Staphylococcus aureus ATCC 25923	Inhibited growth	
Staphylococcus epidermidis ATCC 35984	Good growth	Colony color Blue-green
Staphylococcus aureus ATCC 43300	Good growth	Colony color Magenta

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

PEC Chromogenic Agar

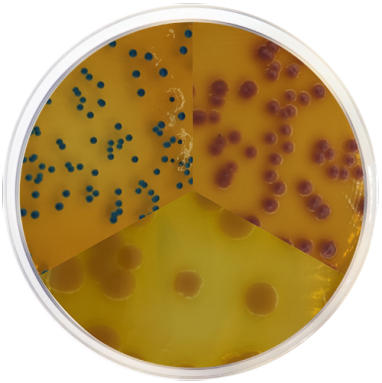
Cat. 2144

For the simultaneous detection of E. coli, Pseudomonas aeruginosa and Candida albicans in cosmetic products.

Practical information

Aplications	Categories
Detection	Pseudomonas aeruginosa
Detection	Escherichia coli
Detection	Candida

Industry: Cosmetics



Principles and uses

PEC Chromogenic Agar a is a selective medium specially formulated for the isolation and detection of E. coli, Pseudomonas aeruginosa and Candida albicans.

For cosmetics and other topical products, the detection of skin pathogens such as Staphylococcus aureus, Pseudomonas aeruginosa, and Candida albicans may be relevant because they can cause skin or eye infection. The detection of other kinds of microorganisms might be of interest since these microorganisms (including indicators of faecal contamination e.g. Escherichia coli) suggest hygienic failure during the manufacturing process.

The medium contains peptone, which provides nitrogen, vitamins, minerals, and amino acids essential for growth. The addition of tryptophan to the medium allows the performance of the Indole test for further E. coli confirmation. The mixture of chromogenic substrates allows the identification of the different species and the bacteriological agar is the solidifying agent.

Formula in g/L

Bacteriological agar	16	Chromogenic mixture	0,5
Peptone	16	Growth factors	13
L-Tryptophan	2		

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 47,5 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. AVOID OVERHEATING. DO NOT AUTOCLAVE. Cool to 45-50 ºC, mix well and dispense into plates.

Instructions for use

- Prepare the sample.
- Subculture by streaking on a plate of Chromogenic PEC Chromogenic Agar, and incubate at 37 ºC for 24-48 h.
- Confirm by identification tests.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber, slightly opalescent	7,2±0,2

Microbiological test

Incubation conditions: (37 ºC / 24-48 h)

Microorganisms	Specification	Characteristic reaction
Candida albicans ATCC 10231	Good growth	Green colonies
Enterococcus faecalis ATCC 19433	Inhibition	
Escherichia coli ATCC 25922	Good growth	Pink colonies/ Fluorescence (+) under UV light
Staphylococcus aureus ATCC 25923	Inhibition	
Pseudomonas aeruginosa ATCC 27853	Good growth	Beige yellow colonies / Fluorescence (+) under UV light
Enterococcus faecalis ATCC 29212	Inhibition	
Staphylococcus aureus ATCC 6538	Inhibition	
Escherichia coli ATCC 8739	Good growth	Pink colonies/ Fluorescence (+) under UV light
Pseudomonas aeruginosa ATCC 9027	Good growth	Beige yellow colonies/Fluorescence (+) under UV light

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

Salmonella Chromogenic Agar

Cat. 1122

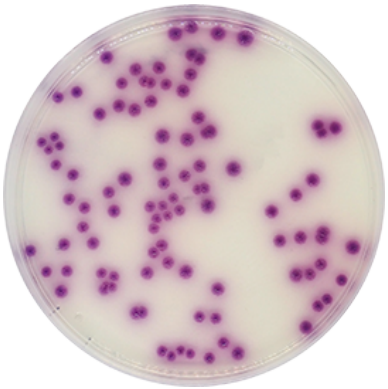
For the isolation of Salmonella spp in clinical samples and foods.

Practical information

Aplications	Categories
Selective isolation	Salmonella

Industry: Clinical / Food

CE
IVD



Principles and uses

Salmonella Chromogenic Agar is a selective chromogenic medium, used for the detection and presumptive identification of Salmonella species from clinical samples, foods and waters. This type of media have been traditionally used to differentiate species of Salmonella from the rest of the Enterobacteriaceae family, (based on their capacity to produce hydrogen sulfide and their inability to ferment lactose) buy they are not really adequate as there are more than 2.000 species of Salmonella which do not have these characteristics.

Casein peptone and beef extract provide nitrogen, vitamins, minerals and amino acids essential for growth. Chromogenic mixture, in conjunction with sodium citrate, aids in inhibiting Gram-positive organisms, Proteus and coliforms. Bacteriological agar is the solidifying agent. The addition of the supplement inhibit accompanying flora, avoiding possible false positive results.

To identify Salmonella species, this chromogenic agent is based on the combination of two chromogenic substrates that ease quick identification. Magenta colonies are a result of the hydrolysis of one of the chromogenic substrate by the Salmonella species due to the inability to utilise another chromogenic substrate. Microorganisms producing the enzyme that cleaves the second chromogenic substrate will produce blue-green colonies. Thus, non-Salmonella organisms appear blue-green or are not stained by any of the chromogenes of the medium. Supplement is added when more selectivity is desired. The supplement inhibit the accompanying flora, specially Pseudomonas, that could appear in the same colour as Salmonella colonies.

The medium can be used as a second medium for the detection of Salmonella in food and water according to ISO 6579 and ISO 19250 respectively.

Formula in g/L

Bacteriological agar	12,8	Casein peptone	5
Chromogenic mixture	5,81	Beef extract	5
Sodium citrate	8,5		

Preparation

Suspend 37,1 grams of the medium in one liter of distilled water at 80 ºC. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. AVOID OVERHEATING. DO NOT AUTOCLAVE. Cool to 45-50 ºC and, if desired, aseptically add two vials of Salmonella Chromogenic Agar Supplement (Cat. 6043). Pour into Petri dishes.

Instructions for use

» For clinical diagnosis, the type of sample is fecal and from rectal tract.

- Inoculate the sample on the surface of the Salmonella Chromogenic Agar plates, streaking to obtain isolated colonies.
- Incubate at a temperature of 35±2 ºC for 18-24 hours.
- Examine the color of the colonies.

» For other uses not covered by the CE marking:

Detection of Salmonella spp in foods according to ISO 6579:
- Preenrichment in non-selective liquid medium:
Inoculate the Buffered Peptone Water (Cat. 1402) with the sample or dilutions, and incubate at 34-38 ºC for 18 h.
- Enrichment in/on selective media:
Inoculate, with the culture obtained in the pre-enrichment stage, the Rappaport Soy Broth (Vassiliadis)(Cat. 1174) or the Modified Semisolid Rappaport Vassiliadis medium (MSRV) (Cat. 1376), and the Tetrathionate Broth (Muller-Kauffmann) (Cat. 1173).
The Rappaport Soy Broth and the Modified Semisolid Rappaport medium are incubated at 41,5 ºC for 24 h, and the Tetrathionate Broth at 37 ºC for 24 h.
- Plating out on selective solid media:
From the selective enriched cultures, inoculate two selective isolation agar; XLD agar (Cat. 1274) and any other selective medium complementary to XLD agar, in this case, Salmonella Chromogenic Agar (Cat. 1122).
Incubate the XLD plates inverted at 35±2 ºC for 18-24 h.
Incubate the Salmonella Chromogenic Agar (Cat. 1122) at 35±2 ºC for 18-24 hours.
- Confirmation:
Subculture colonies of presumptive Salmonella and confirm their identity by biochemicals and serological tests.

Detection of Salmonella spp. in water samples according to ISO 19250:
- Preenrichment in non-selective medium:
Inoculate the Buffered Peptone Water (Cat. 1402) with the sample or dilutions, and incubate at 36±2 ºC for 18±2 h.
- Enrichment in selective media:
Inoculate, with the culture obtained in the pre-enrichment stage, the Rappaport Soy Broth (Vassiliadis)(Cat. 1174) and the Tetrathionate Broth (Muller-Kauffmann) (Cat. 1173).
The Rappaport Soy Broth is incubated at 41,5±1 ºC and the Tetrathionate Broth at 37±1 ºC, both of them for 24±3 hours.
- Plating out on selective solid media:
From the selective enriched cultures, inoculate two selective isolation agar; XLD agar (Cat. 1274) and any other selective medium complementary to XLD agar n this case, (Salmonella Chromogenic Agar (Cat. 1122).
Incubate the XLD plates inverted at 35±2 ºC for 18-24 h.
Incubate the Salmonella Chromogenic Agar (Cat. 1122) at 35±2 ºC for 18-24 hours.
- Confirmation:
Subculture colonies of presumptive Salmonella and confirm their identity by biochemicals and serological tests.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
Precipitates may appear	Fine powder	Beige	Amber, slightly opalescent	7,2±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 18-24 h).

Microorganisms	Specification	Characteristic reaction
Salmonella enteritidis ATCC 13076	Good growth	Magenta colony
Proteus vulgaris ATCC 13315	Inhibited growth	Colorless colony
Salmonella typhimurium ATCC 14028	Good growth	Magenta colony
Salmonella typhi ATCC 19430	Good growth	Magenta colony
Escherichia coli ATCC 25922	Partially inhibited growth	Blue-green colony
Salmonella dyarizoneae ATCC 29934	Good growth	Magenta colony

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

Standard Method Chromogenic Agar (PCA)

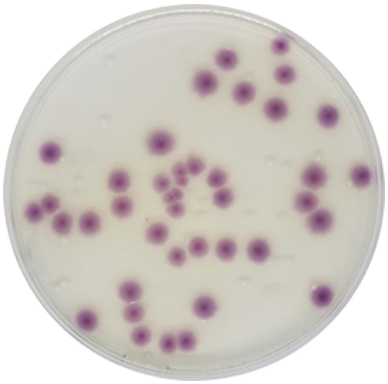
Cat. 1585

For total microbial plate count in foods.

Practical information

Aplications	Categories
Non selective enumeration	General use

Industry: Food



Principles and uses

Standard Method Chromogenic Agar (PCA) is recommended for the enumeration of bacteria, which are indicators of microbial contamination in foods.

Enzymatic digest of casein provides nitrogen, vitamins, minerals and amino acids essential for growth. Yeast extract is source of vitamins, particularly the B-group. Dextrose is the fermentable carbohydrate providing carbon and energy. Bacteriological agar is the solidifying agent. Chromogenic substrate allows quicker differentiation of aerobic microorganisms due to the magenta colonies. Yeast colonies grow as white colonies.

Formula in g/L

Enzymatic digest of casein	5	Bacteriological agar	15
Chromogenic mixture	0,12	Glucose anhydrous	1
Yeast extract	2,5		

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 23,6 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. AVOID OVERHEATING. DO NOT AUTOCLAVE. Dispense into appropriate containers.

Instructions for use

- Add 1 ml of the appropriate test dilution to the sterile medium at a temperature of 44-45°C.
- Mix gently and pour into sterile Petri dishes.
- Alternatively, dispense a portion of each test dilution (e.g., 0.1, 0.01 ml) into separate sterile Petri dishes and add 10-12 ml of tempered (45°C) Standard Methods Chromogenic Agar to the Petri dishes containing test dilutions.
- Swirl the dishes to thoroughly mix the medium and the test dilution.
- Allow plates to cool and solidify.
- Incubate the Petri dishes at 32±2 ºC for 18-48 hours and count the developed colonies.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Clear amber, slightly opalescent	7,0±0,2

Microbiological test

Incubation conditions: (32±2 ºC / 18-48 h).

Microorganisms	Specification	Characteristic reaction
Candida albicans ATCC 10231	Good growth	White colonies
Staphylococcus epidermidis ATCC 12228	Good growth	Magenta colonies
Klebsiella aerogenes ATCC 13048	Good growth	Magenta colonies
Salmonella typhimurium ATCC 14028	Good growth	Magenta colonies
Staphylococcus aureus ATCC 25923	Good growth	Magenta colonies
Escherichia coli ATCC 8739	Good growth	Magenta colonies

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

Staphylococcus Chromogenic Agar

Cat. 2076

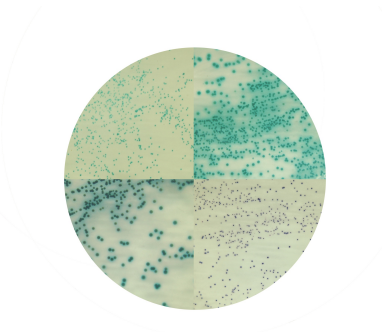
For the detection and differentiation of different species of Staphylococcus

Practical information

Aplications	Categories
Detection	Staphylococcus
Differentiation	Staphylococcus

Industry: Cosmetics / Clinical / Food

CE
IVD



Principles and uses

Staphylococcus Chromogenic Agar is a selective chromogenic medium used for the isolation, quantification and identification of Staphylococcus spp in clinical samples.

S.aureus is a pathogen which causes superficial and systemic infections. Due to its prevalence and clinical implications, its detection is of vital importance.

Staphylococcus chromogenic agar contains the necessary nutrients to develop staphylococcus and, at the same time, the mixture of chromogenic substrates allows the identification of the different species. The inhibitors prevent the development of the accompanying flora.

Formula in g/L

Bacteriological agar	12,5	Peptone mixture	41
Growth factors	56	Chromogenic mixture and inhibitors	0,245

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 110 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Avoid Overheating. Do not autoclave. Cool to 45-50 ºC. Homogenize gently and dispense into Petri dishes.

Instructions for use

For clinical diagnosis, use any type of clinical sample.
- Inoculate and incubate the medium at 35±2 °C for 24-48 hours.
- The staphylococcus usually develops within 24 hours, although there may be some strains which take up to 48 hours.

It can also be used for food, but confirmation test is required.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Light amber, slightly opalescent	7,0 ± 0,2

Microbiological test

Incubation conditions: (35±2 ºC / 24-48 h).

Microorganisms	Specification	Characteristic reaction
Staphylococcus epidermidis ATCC 12228	Good growth	Colony color light green
Salmonella typhimurium ATCC 14028	Inhibited growth	
Staphylococcus saprophyticus ATCC 15305	Good growth	Colony color greenish blue
Escherichia coli ATCC 25922	Inhibited growth	
Staphylococcus aureus ATCC 25923	Good growth	Colony color magenta
Staphylococcus xylosus ATCC 29971	Good growth	Colony color dark blue
Staphylococcus aureus ATCC 43300	Good growth	Colony color magenta

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

TBX Chromogenic Agar (Tryptone Bile X-Glucuronide) ISO

Cat. 1151

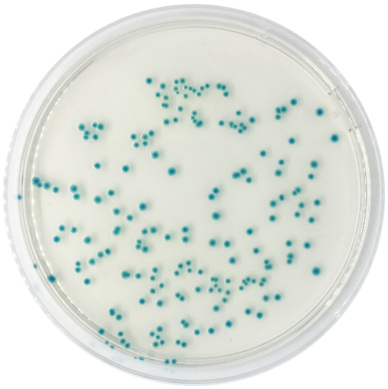
Selective medium for the detection and enumeration of Escherichia coli in foods.

Practical information

Aplications	Categories
Selective enumeration	Escherichia coli
Detection	Escherichia coli

Industry: Food

Regulations: ISO 11133 / ISO 16649



Principles and uses

TBX Chromogenic Agar (Tryptone Bile X-Glucuronide) is based on Tryptone Bile Salts Agar medium, used to detect and enumerate E. coli in foods, with the addition of a chromogenic agent, x-ß-D-Glucuronide, to detect the presence of the enzyme glucuronidase, which is highly specific for E. coli.

The released chromophore in TBX Agar is colored and target colonies are easily identified. E. coli absorbs the chromogenic agent x-ß-D-glucuronide, and the intracellular glucuronidase enzyme activity breaks the bond between the chromophore and the glucuronide. The released chromophore is colored and builds up within the cells, causing the E. coli colonies to be blue-green colored.

Casein peptone provides nitrogen, vitamins, minerals and amino acids essential for growth. Bile Salts are inhibitors to other Gram-positive organisms and suppress coliform bacteria. Bacteriological agar is the solidifying agent.

ISO 16649 specifies a horizontal method for the enumeration of ß-glucuronidase-positive E. coli in products intended for human consumption or for the feeding of animals.

The negative b-ß-glucuronidase E. coli colonies are colorless, e.g. E. coli O157: H7. The high temperatures (44°C) inhibit the growth of E. coli O157: H7.

Formula in g/L

Enzymatic digest of casein	20	Bacteriological agar	15
Bile salts N° 3	1,5	5-bromo-4-cloro-3-indolil-ß-D-glucuronic acid	0,075

Preparation

Suspend 36,6 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Sterilize in autoclave at 121 ºC for 15 minutes. Cool to 45-50 ºC, mix well and dispense into plates.

Instructions for use

Enumeration of ß-glucuronidase-positive Escherichia coli according to ISO 16649:
- Inoculate the TBX agar either by the plating method in depth, seeding on the surface or by the membrane filtration method.
- The membrane filtration method and the enumeration by the most probable number technique needs a previous resuscitation stage in Minerals Modified Glutamate Agar or Broth MMGA or MMGB (Cat. 1365).
- Incubate the plates of TBX agar for 21 hours at a temperature of 44 °C.
- Calculate the number of positive Escherichia coli ß-glucuronidase colonies from the number of typical blue colonies.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Ámber slightly opalescent	7,2 ± 0,2

Microbiological test

According to ISO 11133:
Incubation conditions: (44±1 ºC / 21±3 h).
Inoculation conditions: Productivity quantitative (100± Min. 50 CFU) / Productivity cualitative (10^3-10^4 CFU) / Selectivity (10^4-10^6 CFU) / Specificity (10^3-10^4 CFU).
Reference media: TBX.

Microorganisms	Specification	Characteristic reaction
Enterococcus faecalis ATCC 19433	Total inhibition (0)	
Escherichia coli ATCC 25922	Good growth (2) >50%	Blue colonies
Pseudomonas aeruginosa ATCC 27853		White to green-beige colonies
Enterococcus faecalis ATCC 29212	Total inhibition (0)	
Citrobacter freundii ATCC 43864		White to green-beige colonies
Escherichia coli ATCC 8739	Good growth (2) >50%	Blue colonies
Escherichia coli CECT 9153	Good growth (2) >50%	Blue colonies

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

Urinary Tract Infections Chromogenic Agar (UTIC)

Cat. 1424

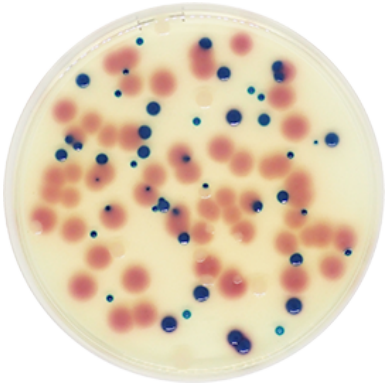
For the presumptive detection and differentiation of organisms causing urinary tract infections

Practical information

Aplications	Categories
Detection	Urinary tract pathogens

Industry: Clinical

CE IVD



Principles and uses

Urinary Tract Infections Chromogenic Agar (UTIC) is a chromogenic medium for the presumptive identification and confirmation of microorganisms causing urinary tract infections. The microorganisms which cause infections in the urinary tract are generally abundant and of only one species: E. coli is the organism most frequently isolated.

Peptone mixture provides nitrogen, vitamins, minerals and amino acids essential for growth. The medium includes two chromogenic substrates which are cleaved by enzymes produced by Enterococcus spp, Escherichia coli and coliforms. It also includes phenylalanine and tryptophane providing a presumptive indication of the tryptophane deaminase activity, which illustrates the presence of Proteus spp., Morganella spp, and Providencia spp. (brown colonies). This is based on CLED Agar. Bacteriological agar is the solidifying agent.

One of the chromogenes is metabolised by ß-glucosidase enzyme activity, allowing the specific detection of enterococci which form blue or turquoise colonies. The other chromogen is cleaved ß-galactosidase, an enzyme produced by E. coli which grows as pink colonies. (In case of unreliable colony results, carry out Indol test).

When bacteria cleaves both chromogenic substrates, it results in dark blue - purple colonies, characteristical of coliforms bacteria as E. aerogenes, K.pneumoniae and C. freundii.

It should be noted that, as with all chromogenic media, microorganisms with atypical enzyme patterns may give anomalous reactions. For example 45% of Enterobacter cloacae do not contain ß-glucosidase, therefore resulting in pink colonies not distinguishable from E. coli. For confirmation, the Indol test must be performed.

Formula in g/L

Bacteriological agar	16	Peptone mixture	16
Tryptophan	2	Growth factors	13
Chromogenic Substrate	0,5		

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 47,5 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Sterilize in autoclave at 121 ºC for 15 minutes. Cool to 45-50 ºC, mix well and dispense into plates.

Instructions for use

For clinical diagnosis, the type of sample is urine. Urine from the middle part of urination, from the catheter or collection can be used by suprapubic bladder puncture.
- Inoculate on the surface. Parallel striae with the handle or hyssop.

- Incubate in aerobic conditions at 35±2 °C for 18-24 hours.
- Reading and interpretation of results.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
	Fine powder	Beige	Amber, slightly opalescent	7,2±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 18-24 h).

Microorganisms	Specification	Characteristic reaction
Klebsiella aerogenes ATCC 13048	Good growth	Dark Blue colony
Klebsiella pneumonieae ATCC 13883	Good growth	Dark Blue colony
Salmonella typhimurium ATCC 14028	Good growth	Amber colony
Enterococcus faecalis ATCC 19433	Good growth	Light blue colony
Escherichia coli ATCC 25922	Good growth	Pink colony
Staphylococcus aureus ATCC 25923	Good growth	(natural pigmentation) White cream colony
Proteus mirabilis ATCC 25933	Good growth	Light brown colony
Pseudomonas aeruginosa ATCC 27853	Good growth	Amber colony
Salmonella typhi ATCC 6539	Good growth	Amber colony

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

Vancomycin-Resistant Enterococcus (VRE) Chromogenic Agar

Cat. 2077

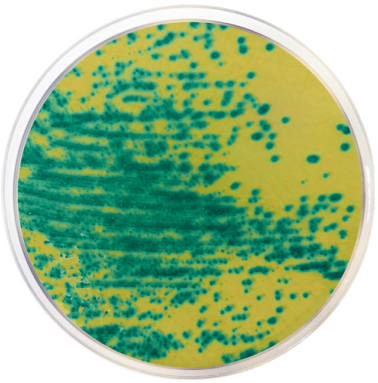
For the detection of vancomycin-resistant enterococci.

Practical information

Aplications	Categories
Detection	Enterococci

Industry: Clinical

CE IVD



Principles and uses

Vancomycin-Resistant Enterococcus (VRE) Chromogenic Agar is used to detect vancomycin-resistant enterococci.

The medium contains the necessary nutrients for the development of vancomycin-resistant enterococcus. The chromogenic substrate produces colonies which are greenish-blue in color and the inhibitors in the medium prevent the growth of accompanying flora. Vancomycin inhibits all Enterococcus faecalis susceptible to it.

Enterococci are bacteria found in the human digestive and female genital tracts, although they do not pose a threat to healthy people. Infections occur more commonly in people who are hospitalized and who may be more susceptible to infection. Health professionals use vancomycin as an antibiotic to treat infections but, upon exposure to it, some bacteria will develop vancomycin-resistance. Enterococci are particularly interesting because, as with many of their bacterial counterparts, they can resist different forms of antibiotic treatment, including vancomycin, usually the last resort for resistant infections.

Formula in g/L

Bacteriological agar	15	Sodium chloride	15
Vancomycin	0,005	Growth factors	41
Chromogenic Substrate and Inhibitors	0,477		

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 71,5 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until completely dissolved. AVOID OVERHEATING. DO NOT AUTOCLAVE. Cool to 45-50 ºC, mix well and dispense into plates.

Instructions for use

For clinical diagnosis, use any type of sample of clinical origin.
- Inoculate on the surface and incubate in aerobic conditions at 35±2 ºC for 18-24 h.
- Reading of results.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber, slightly opalescent	7,1±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 18-24 h).

Microorganisms	Specification	Characteristic reaction
Klebsiella aerogenes ATCC 13048	Total inhibition	
Salmonella typhimurium ATCC 14028	Total inhibition	
Enterococcus faecalis ATCC 19433	Total inhibition	
Enterococcus faecium ATCC 19434	Total inhibition	
Escherichia coli ATCC 25922	Total inhibition	
Staphylococcus aureus ATCC 25923	Total inhibition	
Enterococcus faecalis ATCC 29212	Total inhibition	
Enterococcus faecalis ATCC 33186	Total inhibition	
Enterococcus faecalis ATCC 51299	Good growth	Greenish-blue colonies

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

Vibrio Chromogenic Agar

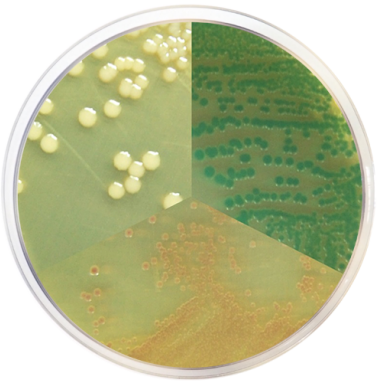
Cat. 2054

For isolation and detection of Vibrio cholerae, Vibrio parahaemolyticus and Vibrio vulnificus.

Practical information

Aplications	Categories
Selective isolation	Vibrio

Industry: Water / Food



Principles and uses

Vibrio Chromogenic Agar is recommended for the selective isolation and differentiation of Vibrio species based on colony colors, due to the enzymatic activities of ß-galactosidase and ß-glucosidase.

The Vibrio genus consists of micro-organisms whose natural habitat is marine and fluvial ecosystems. They are frequently isolated from marine water, especially in warmer months and when the water temperature is higher than 17 ºC. Vibrio species are mainly responsible for causing cholera and food poisoning in humans.

The medium contains yeast extract and peptones which are the source of nitrogen, vitamins (particularly the B-group essential for bacterial growth), minerals and amino acids. Special Bilis inhibits Gram-positive organisms. Sucrose, glucose and lactose are the fermentable carbohydrates, which provide carbon and energy. Sodium chloride supplies essential electrolytes for transport and osmotic balance. Sodium citrate, sodium thiosulfate and sodium cholate are the selective agents, inhibiting the Gram-positive bacteria. Chromogenic substrate is added to detect Vibrio species by means of a color change in the colonies.

This medium is designed for the development and diferentation of 3 types of Vibrio depending on the enzyme activity of each strain. ß-glucosidase activity will appear as blue-green colonies, as in the case of V. parahaemoliticus. The activity of ß-galactosidase enzyme will show red or pink colonies in the case of V. cholerae. And finally, the yellowish-white colonies will be V. alginolyticus, which has ß-galactosidase, but is not expressed due to the high concentration of sugars. The alkaline pH of the medium enhances the recovery of V. cholerae.

ISO 21872: Microbiology of the food chain - Horizontal method for the detection of potentially enteropathogenic species Vibrio spp. Detection of Vibrio parahaemolyticus, Vibrio cholerae and Vibrio vulnificus (ISO 21872-1: 2017), recommends an alternative selective medium to TCBS for the detection of Vibrio enteropathogenic species.

Formula in g/L

Glucose	1	Bacteriological agar	15
Chromogenic mixture	2,49	Lactose	0,1
Peptone	10	Sodium chloride	10
Sodium cholate	3	Sodium citrate	10
Sodium thiosulfate	10	Sucrose	20
Yeast extract	3	Special bilis	5

Preparation

Suspend 90 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution Avoid overheating. DO NOT AUTOCLAVE. Dispense into appropriate containers.

Instructions for use

Detection of potentially enteropathogenic Vibrio parahaemolyticus, Vibrio cholerae and Vibrio vulnificus according to ISO 21872:
- Take test portions (25 g or 25 ml) and homogenize in 225 ml of enrichment medium ASPW. In the case of large quantities of test portion, the ASPW should be warmed to 37±1 ºC / 41,5±1 ºC before inoculation.
- Incubate the initial suspension at 41,5±1 ºC / 37±1 ºC for 6±1 hours.
- Transfer 1 ml from the surface into a tube with 10 ml of ASPW.
- Incubate the ASPW at 41,5±1 ºC / 37±1 ºC for 18±1 hours.
- From the culture obtained in the ASPW, inoculate 1 µl in TCBS Agar. Incubate a second selective isolation medium (Vibrio Chromogenic Agar).
- Incubate at 37±1 ºC for 24±3 hours.
- Confirmation.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Amber	8,6 ± 0,2

Microbiological test

Incubation conditions: (35±2 ºC / 24-48 h)

Microorganisms	Specification	Characteristic reaction
Vibrio cholerae ATCC 14034	Good growth	Pink-rose colony
Vibrio alginolyticus ATCC 17749	Good growth	Colorless colony
Vibrio parahemolyticus ATCC 17802	Good growth	Green-blue colony
Vibrio vulnificus ATCC 27562	Good growth	Pink-rose colony
Pseudomonas aeruginosa ATCC 27853	Inhibited growth	

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

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