HiCrome™

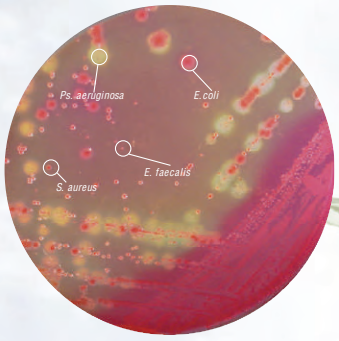
Single Streak Rapid Differentiation Series

HIMEDIA®

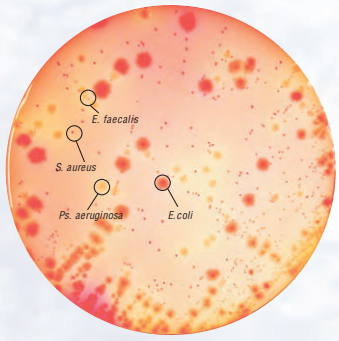
For life is precious

Now 750 Culture Media based on animal free HiVegtones

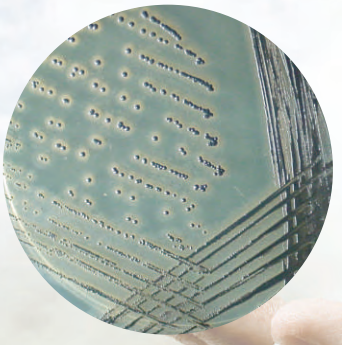
Comparative Performance



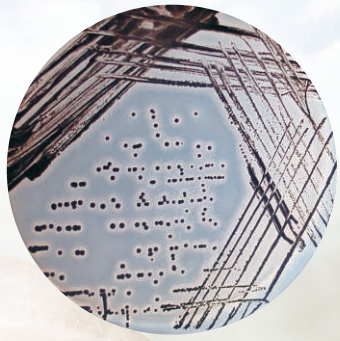
MV082 MacConkey HiVeg Agar
(Mix Culture)



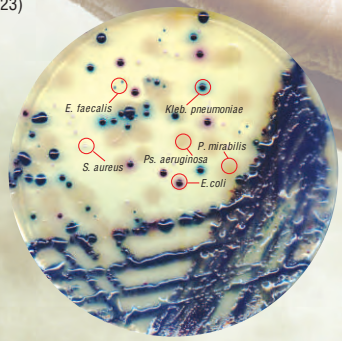
M082 MacConkey Agar
(Mix Culture)



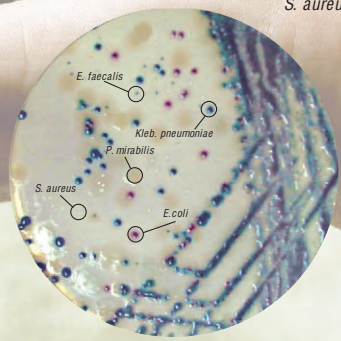
MV043 Baird Parker HiVeg Agar Base
S. aureus (ATCC 25923)



M043 Baird Parker Agar Base
S. aureus



MV1353 HiCrome UTI HiVeg Agar
(Mix Culture)



M1353 HiCrome UTI Agar
(Mix Culture)

ISO 9001-2000 CERTIFIED

WHO GMP DNV CERTIFIED

CE

ISO 13485-2003 CERTIFIED

HiCrome™

Single Streak Rapid Differentiation Series

Conventional culture media procedures, though a reliable way of detecting micro-organisms lack speed and accuracy of isolation and differentiation so critical in dealing with pathogenic microorganisms.

HiMedia's HiCrome range of culture media employing the chromogen technology of visual identification significantly removes the guesswork out of identification and differentiation, thereby obviating the need for subculturing, thus saving time.

The methodology is simple and precisely designed for each bacteria. Organisms are identified through simple enzymatic reactions specific to their species, yielding visually distinct colours.

Over the past decade chromogenic media have been well researched and documented to merit incorporation in standard microbiology lab protocols.

HiMedia have been a part of this global revolution in diagnostic microbiology where we have developed the largest range of chromogenic media, and the research continues.

We also offer the range of these HiCrome media in the HiCromeVeg version, wherein the animal based nutrients have been substituted with their veg-based counterparts.

ISO 9001-2000 CERTIFIED

WHO GMP DNV CERTIFIED

CE

ISO 13485-2003 CERTIFIED

HIMEDIA®

14 Chromogenic Media are also available in the HiCromeVeg Category where animal based nutrients have been substituted with Vegetable based nutrients

HiCrome™
Single Streak Rapid Differentiation Series

HiCromeVeg™
Single Streak Rapid Differentiation Series

Corresponding lists of Chromogenic media containing Animal peptone and HiVeg™ peptones

HiCrome Animal Peptone Based Media	HiCrome Veg-Peptone Based media
M1297 - HiCrome Candida Agar	MV1297 - HiCrome Candida HiVeg™ Agar
M1456 - HiCrome Candida Agar Base, Modified	M1456 - HiCrome Candida HiVeg™ Agar Base, Modified
M1294 - HiCrome ECC Selective Agar Base	MV1294 - HiCrome ECC Selective HiVeg™ Agar Base
M1295 - HiCrome E. Coli Agar	MV1295 - HiCrome E. coli HiVeg™ Agar
M1353 - HiCrome UTI Agar	MV1353 - HiCrome UTI HiVeg™ Agar
M1418 - HiCrome UTI Agar, Modified	MV1418 - HiCrome UTI HiVeg™ Agar, Modified
M1505 - HiCrome UTI Selective Agar	MV1505 - HiCrome UTI Selective HiVeg™ Agar
M1082 - Salmonella Differential Agar, Modified	MV1082 - Salmonella Differential HiVeg™ Agar, Modified
M1078 - Salmonella Differential Agar (Rajhans Media)	MV1078 - Salmonella Differential HiVeg™ Agar (Rajhans Media)
M1293 - HiCrome ECC Agar	MV1293 - HiCrome ECC HiVeg™ Agar
M1300 - HiCrome Coliform Agar	MV1300 - HiCrome Coliform HiVeg™ Agar
M1465 - Rapid HiColiform Agar	MV1465 - Rapid HiColiform HiVeg™ Agar
M1453 - Rapid HiColiform Broth	MV1453 - Rapid HiColiform HiVeg™ Broth
M1468 - HiCrome Aureus Agar Base	MV1468 - HiCrome Aureus HiVeg™ Agar Base
M1488 - HiCrome ECD Agar w/MUG	MV1488 - HiCrome ECD HiVeg™ Agar w/MUG
M1540 - L.mono Differential Agar Base	MV1540 - L.mono Differential HiVeg™ Agar Base
M1393 - HiCrome MM Agar	M1393 - HiCrome MM HiVeg™ Agar

HiCromeVeg™ Single Streak Rapid Differentiation Series *Freedom from BSE / TSE worries*

HiCrome ECC Selective Agar Base (M1294) is also available as HiCrome ECC Selective HiVeg™ Agar Base (MV1294) wherein all the animal origin nutrients have been replaced by vegetable based nutrients.

HIMEDIA®

Chromogenic Media Index / Cross References

Equivalent Media of various Brands

Page no.	Code	HiMedia	CHROMagar/ Difco - BD	Merck	Oxoid	Remel
1	M1293	**HiCrome ECC Agar**	CHROMagar ECC	—	Chromogenic *E. coli* / Coliform Medium	—
2	M1294	**HiCrome ECC Selective Agar**	—	Chromocult Coliform Agar	Selective *E. coli* Coliform chromogenic medium	—
3	M1300	**HiCrome Coliform Agar (w/ SLS)**	—	Chromocult Coliform Agar	—	—
4	M1426	**M-E. coli Broth**	—	—	—	—
5	M1569	**HiCrome Lauryl Sulphate Agar**	—	—	—	—
6	M1295 / M1295I	**HiCrome E. coli Agar / Modified**	CHROMagar *E. coli*	Chromocult TBX Tryptone Bile X-Glucuoronide Agar	Tryptone Bile X-Glucuronide Medium (TBX)	—
7	M1571	**HiCrome M-TEC Agar**	m-TEC Agar	—	—	—
8	M1340	**HiCrome MacConkey Sorbitol Agar Base**	CHROMagar .0157	—	MacConkey Sorbitol Agar (w/ Chromogenic substrate)	Sorbitol MacConkey Agar w/ BCIG
9	M1574	**HiCrome EC.0157:H7Agar**	CHROMagar .0157	—	—	—
10	M1575	**HiCrome ECO157:H7 Selective Agar Base***	—	—	—	—
11	M1598	**HiCrome Enrichment Broth Base for ECO157:H7**	—	—	—	—
12	M1505	**HiCrome UTI Selective Agar**	—	—	—	—
13	M1353 / M1418	**HiCrome UTI Agar / Modified**	CHROMagar Orientation	—	Chromogenic UTI Medium	Chromogenic UTI Medium
14	M1078 / M1082	**Salmonella Differential Agar (Rajhans Medium / modified) (Twin pack)**	Rambach Agar	Rambach Agar	—	—
15	M1296 / M1466	**HiCrome Salmonella Agar / HiCrome Improved Salmonella Agar**	CHROMagar Salmonella	—	Salmonella Chromogenic Agar Base	Salmonella Chromogenic Agar
16	M1393	**HiCrome MM Agar**	—	—	—	—
17	M1414 / M1376	**HiCrome Enterococci Agar / Broth**	—	Chromocult Enterococci Broth	—	—
18	M1580	**HiCrome Enterococcus faecium Agar Base**	—	—	—	—
19	M1297 / M1456	**HiCrome Candida Agar / Modified**	CHROMagar Candida	—	Chromogenic Candida Agar	Chromogenic Candida Agar
20	M1467	**HiCrome OGYE Agar Base**	—	—	—	—
21	M1577	**HiCrome Enterobacter sakazakii Agar**	—	—	Chromogenic Enterobacter sakazakii Agar	Chromo E. sakazakii Medium
22	M1641	**HiCrome Ent. sakazakii Agar, Modified**	—	—	Chromogenic Enterobacter sakazakii Agar	—
23	M1573	**HiCrome Klebsiella Selective Agar Base**	—	—	—	—
24	M1540	**L.mono Differential Agar Base**	CHROMagar Listeria	—	—	—
25	M1417	**HiCrome Listeria Agar, Modified**	—	—	—	—
26	M1468	**HiCrome Aureus Agar Base**	—	—	—	—
27	M1354	**MCP Agar**	—	—	—	—
28	M1651	**HiCrome Bacillus Agar**	—	—	Chromogenic Bacillus cereus Agar	—
30	M1469	**HiFluoro Pseudomonas Agar Base**	—	—	—	—
31	M1465 / M1453	**Rapid HiColiform Broth / Agar**	—	Fluorocult LMX Broth Modified (Manafi and Ossmer)	—	—
32	M1488	**HiCrome ECD Agar w/ MUG**	—	—	—	—

HIMEDIA®

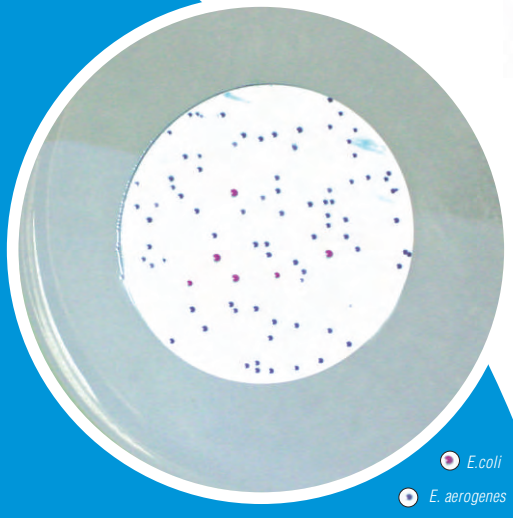
* = Equivalant to BIOSYNTH'S BCM ™ 0157 Agar

HIMEDIA®

HiCrome™

Single Streak Rapid Differentiation Series

HiCrome Media for Water Testing

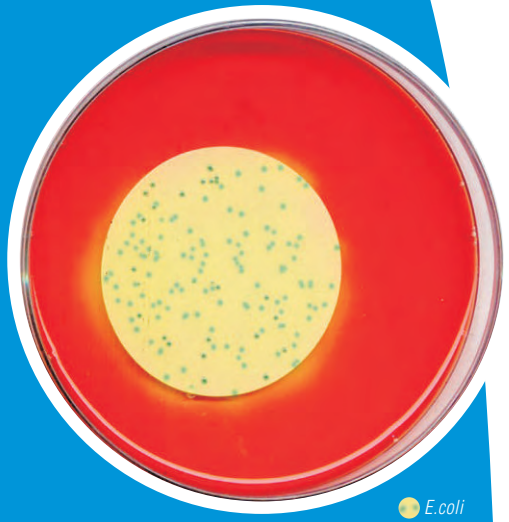


M1426

For Identification and Differentiation of E. coli and Total coliforms

M-E. coli Broth – M1426

For the detection, differentiation and enumeration of *Escherichia coli* and coliforms in water samples by membrane filtration technique.

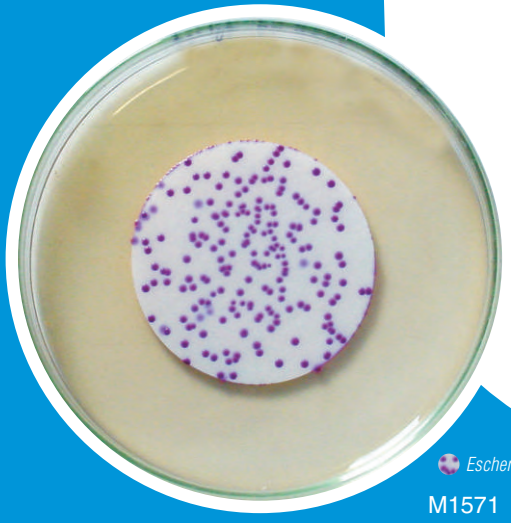


M1569

For Identification and Differentiation of E. coli and Total coliforms

HiCrome M-Lauryl Sulphate Agar – M1569

For the differentiation and enumeration of *Escherichia coli* and other coliforms by a single membrane filtration technique



M1571

For Identification of E. coli

HiCrome M-TEC Agar – M1571

For detection of Thermotolerant *Escherichia coli* in water by the membrane filtration technique.

HiCrome ECC Agar

A differential medium recommended for presumptive identification of *Escherichia coli* and other coliforms in food and environmental samples.

M1293

HiCrome ECC Agar is a differential medium recommended for presumptive identification of *Escherichia coli* and other coliforms in food and environmental samples.

Composition **

Ingredients	Grams/Litre
Peptone, special	5.00
Yeast extract	3.00
Lactose	2.50
Disodium hydrogen phosphate	3.50
Monopotassium dihydrogen phosphate	1.50
Sodium chloride	5.00
Chromogenic mixture	20.30
Neutral red	0.03
Agar	15.00

Final pH (at 25°C) 6.8 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 55.83 grams in 1000 ml distilled water. Boil gently to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 50°C. Mix well and pour into sterile petri plates. The medium show haziness, but it does not affect the performance.

Principle and Interpretation

HiCrome ECC Agar is a differential medium recommended for the presumptive identification of *Escherichia coli* and other coliforms in food and environmental samples (3).

The medium contains two chromogens one chromogen is cleaved by the enzyme glucuronidase produced by *Escherichia coli* and given blue to purple colouration, and other chromogen is cleaved by the enzyme galactosidase produced by majority of coliforms, resulting in rose-pink colonies (1,2).

Peptone special and yeast extract provide nitrogenous substances, vitamin B complex and other essential growth nutrients. Lactose is a fermentable carbohydrate, with neutral red as an indicator. Disodium hydrogen phosphate and potassium dihydrogen phosphate buffer the medium well. Sodium chloride maintains the osmotic equilibrium.

Dry the surface of the medium before use. Dilute the food sample by 1 : 5 or 1 : 10 with 0.1% sterile Peptone Water (M028) and homogenize in a blender or a stomacher. Spread 0.5 ml or 1.0 ml of the homogenate over the agar surface with a sterile glass spreader and incubate the plates at 37°C for 18 - 24 hours. Count the blue/purple colonies and multiply with dilution factor. The number of *Escherichia coli* are reported per gram of food.

Quality Control

Appearance of Powder	: Light pink coloured, homogeneous, free flowing powder.
Gelling	: Firm, comparable with 1.5% Agar gel.
Colour and Clarity	: Reddish pink coloured, opaque gel forms in petri plates.
Reaction	: Reaction of 5.58% w/v aqueous solution is pH 6.8 ± 0.2 at 25°C.
Cultural Response	: Cultural characteristics after 18 - 24 hours at 35 - 37°C.

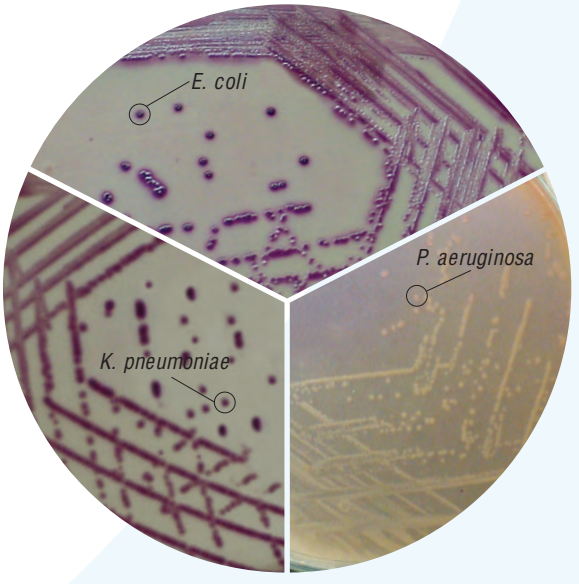
Organisms (ATCC)	Growth	Colour of colony
E. coli (25922)	luxuriant	blue/purple
K. pneumoniae (13883)	luxuriant	rose pink
P. aeruginosa (27853)	good-luxuriant	straw

References

1. Kilian M. and Bulow P., (1976), Acta. Pathol. Microbiol. Scand., Sect. B, 84:245.
2. Kilian M. and Bulow P., (1979), Acta. Pathol. Microbiol. Scand., Sect. B, 87:271.
3. Frampton E.W., Restaino L. and Blaszko N., (1988), J. Food Prot., 51:402.

Storage and Shelf-life

Store at 2- 8°C in tightly capped container. Use before expiry date on the label.



M1293

HiCrome ECC Selective Agar Base

For chromogenic detection of *Escherichia coli* and coliforms in water and food samples.

M1294

HiCrome ECC Selective Agar isrecommended for detection of *Escherichia coli* and coliforms in water and food samples.

Composition **

Ingredients	Grams/Litre
Peptone, special	6.00
Casein enzymic hydrolysate	3.30
Sodium dihydrogen phosphate	0.60
Disodium hydrogen phosphate	1.00
Sodium chloride	2.00
Sodium pyruvate	1.00
L-Tryptophan	1.00
Sorbitol	1.00
Tergitol-7®	0.15
Chromogenic mixture	0.43
Agar	10.00

Final pH (at 25°C) 6.8 ± 0.2
** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 26.48 grams in 1000ml distilled water. Heat in a boiling water bath or in a free flowing steam, with stirring to dissolve the medium completely (approximately 35 minutes). DO NOT AUTOCLAVE OR OVERHEAT. If desired, selective medium can be prepared by aseptically adding 1 vial of HiCrome ECC Selective Supplement (FD190) to previously cooled sterile medium. Mix well and pour into sterile petri plates. Medium may show haziness, but it does not affect the performance.

Principle and Interpretation

HiCrome ECC Selective Agar is a selective medium recommended for the simultaneous detection of *Escherichia coli* and total coliforms in water and food samples.

The chromogenic mixture contains two chromogenic substrates The enzyme β-galactosidase produced by coliforms cleaves the chromogen resulting in the salmon tored colouration. The enzymeβ-glucuronidase produced by *Escherichia coli,* cleaves X-glucuronide. Colonies of *Escherichia coli* are dark blue to violet coloured due to cleavage of both the chromogen. The addition of L-tryptophan improves the indole reaction, thereby increasing detection reliability. Cefsulodin, (FD190) when added inhibits *Pseudomonas* and *Aeromonas species.*

Sorbitol is a fermentable carbohydrate. Phosphates buffer the medium well. All these ingredients help even the sublethally injured coliforms to grow rapidly. Tergitol-7® inhibits gram-positive as well as some gram - negative bacteria other than coliforms. Peptone special and, sodium pyruvate provide nitrogenous substances, and other essentialgrowth nutrients for the organisms.

The medium is inoculated either by pour plate technique or by spreading the sample on the surface of plated medium. Membrane filter technique can also be used. To confirm *Escherichia coli,* add a drop of Kovac's reagent on the dark-blue to violet colony. Formation of cherry - red colour indicates the positive reaction.

Quality Control

Appearance of powder	:	Beige coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.0% Agar gel.
Colour and Clarity	:	Light pink coloured, clear to slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 2.65% w/v aqueous solution is pH 6.8 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics oberved after 24 hours at 35-37°C.

Organisms (ATCC)	Colour of colony	Indole
E. coli (25922)	dark blue to violet	+
E. coli 0157:H7	salmon to red	+
E. aerogenes (13048)	salmon to red	-
C. freundii (8090)	salmon to red	-
S. serotype Enteritidis (13076)	colourless	-
Sh. flexneri (29508)	colourless to slightly pink	-
E. faecalis (29212)	inhibited	-

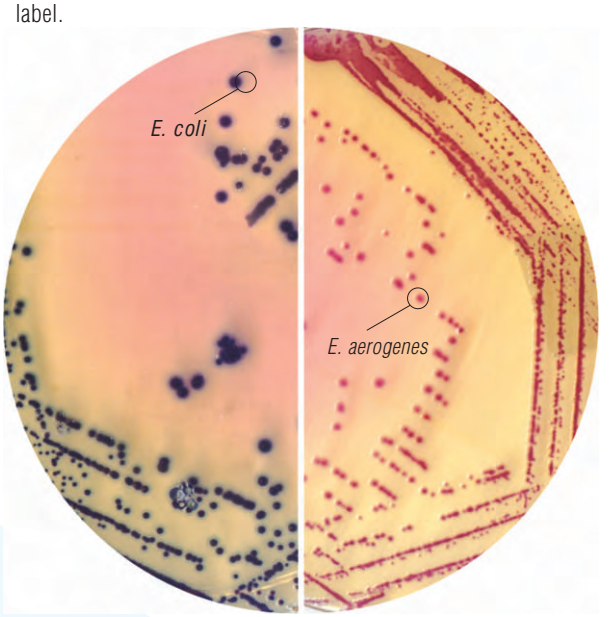
Key : + = positive reaction, - = negative reaction.

References

1. Frampton E.W., Restaino L. and Blaszko N. (1988), J. Food Prot., 51:402.
2. Kilian M. and Bülow P., (1976), Acta. Pathol. Microbiol. Scand., Sect. B, 84:245.
3. LeMinor L. and Hamida F., (1962), Ann. Inst. Pasteur (Paris), 102:267.
4. Manafi M. and Kneifl W., (1989), Zentralbl. Hyg., 189:225.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1294

HiCrome Coliform Agar w/ SLS

Selective chromogenic agar for the simultaneous detection of total coliforms and *Escherichia coli* in water and food samples.

M1300

HiCrome Coliform Agar with Sodium lauryl sulphate is recommended for the simultaneous detection of *Escherichia coli* and total coliforms in water and food samples.

Composition **

Ingredients	Grams/Litre
Peptone, special	3.00
Sodium chloride	5.00
Dipotassium hydrogen phosphate	3.00
Potassium dihydrogen phosphate	1.70
Sodium pyruvate	1.00
L-Tryptophan	1.00
Sodium lauryl sulphate	0.10
Chromogenic mixture	0.20
Agar	12.00

Final pH (at 25°C) 6.8 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 27.0 grams in 1000 ml distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. When a high number of gram-positive accompanying bacteria are expected, add 5 mg/L Novobiocin before autoclaving the medium.

Principle and Interpretation

HiCrome Coliform Agar is a selective medium recommended for the simultaneous detection of *Escherichia coli* and total coliforms in water and food samples.

Peptone special and sodium pyruvate provide essential growth nutrients to the organisms. The phosphates buffer the medium well. The medium composition helps even the sublethally injured coliforms to grow rapidly. Sodium lauryl sulphate inhibits gram-positive organisms.

The enzyme β-galactosidase produced by coliforms cleaves one chromogen, resulting in the purple colouration of coliform colonies. The enzyme β-glucuronidase produced by *Escherichia coli*, cleaves X-glucuronide. *Escherichia coli* forms blue coloured colonies due to cleavage of both the chromogens. The addition of L-tryptophan improves the indole reaction, thereby increasing detection reliability in combination with the two chromogens. To confirm *Escherichia coli*, add a drop of Kovac's reagent on the blue colony. Formation of cherry-red colour indicates the positive reaction.

Quality Control

Appearance of powder	:	Beige coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.2% Agar gel.
Colour and Clarity	:	Colourless, clear to very slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 2.70% w/v aqueous solution is pH 6.8 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics after 24 hours (48 hours if necessary) at 35 - 37°C.

Organisms (ATCC)	Colour of colony	Indole
Escherichia coli (25922)	dark blue/violet	+
Enterobacter cloacae (13047)	salmon to red	-
Citrobacter freundii (8090)	salmon to red	-
Klebsiella pneumoniae (13883)	light pink	-
Salmonella serotype Enteritidis (13076)	colourless	-
Shigella flexneri (12022)	colourless	-
Enterococcus faecalis (29212)	inhibited	-

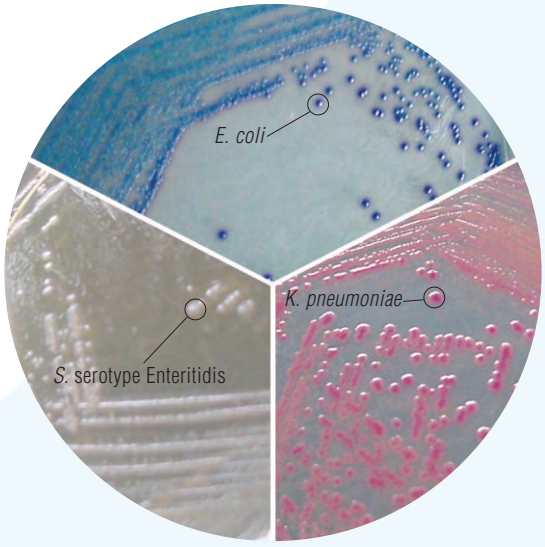
Key : + = positive reacion, - = negative reaction

References

1. Frampton E.W., Restaino L. and Blaszko N., (1988), J. Food Prot., 51:402.
2. Kilian M. and Bülow P., (1976), Acta. Pathol. Microbiol. Scand., Sect. B, 84:245.
3. LeMinor L. and Hamida F., (1962), Ann. Inst. Pasteur (Paris), 102:267.
4. Manafi M. and Kneifel W., (1989), Zentralbl. Hyg., 189:225.

Storage and Shelf-life

Store at 2- 8°C in tightly capped container. Use before expiry date on the label.



M1300

M-E. coli Broth

For the detection, differentiation and enumeration of *Escherichia coli* and coliforms in water samples by membrane filtration technique.

M1426

M-E.coli Broth is recommended for the detection, differentiation and enumeration of *Escherichia coli* and coliforms in water samples using membrane filter technique.

Composition **

Ingredients	Grams/Litre
Casein enzymic hydrolysate	20.00
Bile salts mixture	1.50
Chromogenic mixture	0.175

Final pH (at 25°C) 7.2 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 21.67 grams in 1000 ml distilled water. Boil gently to dissolve the medium completely. DO NOT AUTOCLAVE OR OVERHEAT. On cooling, aseptically add desired quantity (2to 5 ml) of broth on sterile absorbent cotton pad for saturation. The medium should be used within 24 hours of rehydration.

Principle and Interpretation

M-E.coli Broth is used for detection and differentiation of *Escherichia coli* and coliforms in water samples using membrane filter technique. It is based on Tryptone Bile Agar used for detection of *Escherichia coli* in foods (1) where recovery of *Escherichia coli* is faster, more reliable and accurate.

The water sample is filtered through membranes and then placed on pad saturated with M-E.coli Broth and incubated at 37°C in sealed petri plates. The medium contains chromogenic mixture which helps to detect glucuronidase activity of *Escherichia coli* (2). This specific enzyme differentiates *Escherichia coli* from other coliforms. *Escherichia coli* cells split the chromogenic mixture with the help of glucuronidase to give blue to green colouration to the colonies. Coliforms other than *Escherichia coli* turn red as they reduce TTC (2,3,5-triphenyl tetrazolium chloride). Thus, the resulting colour distinction allows simple interpretation of test without further confirmation. Casein enzymic hydrolysate provides the essential growth nutrients to the organisms. Bile salts inhibit gram - positive organisms.

Quality Control

Appearance	:	Beige coloured, homogeneous, free flowing powder.
Colour and Clarity	:	Light yellow coloured, clear solution.
Reaction	:	Reaction of 2.16% w/v aqueous solution is pH 7.2 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics after 18-24 hours at 35 -37°C.

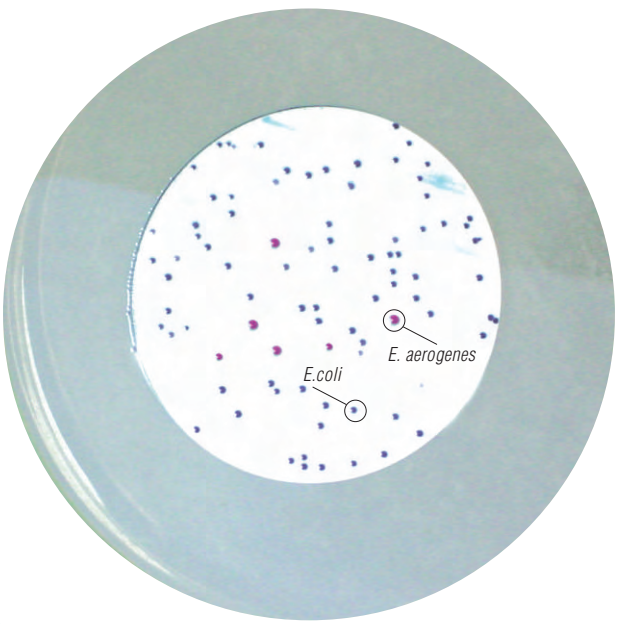
Organisms (ATCC)	Growth	Colour of colony
E. coli (25922)	luxuriant	bluish-green
E. aerogenes (13048)	luxuriant	red
S. aureus (25923)	inhibited	—

References

1. Anderson J. M. and Baird Parker A.C., (1975), J. Appl. Bact., 39:111.
2. Hansen W. and Yourassawsky E., (1984), J. Clin. Microbiol. 20:1177.

Storage and Shelf-life

Store at 2- 8°C in tightly capped container. Use before expiry date on the label.



M1426

HiCrome M-Lauryl Sulphate Agar

M1569

For the differentiation and enumeration of *Escherichia coli* and other coliforms by a single membrane filtration technique

HiCrome M-Lauryl Sulphate Agar is recommended for the differentiation and enumeration of *Escherichia coli* and other coliforms by a single membrane filtration technique.

Composition **

Ingredients	Grams/Litre
Peptic digest of animal tissue	40.0
Yeast extract	6.0
Lactose	30.0
Phenol red	0.2
Sodium lauryl sulphate	1.0
Sodium pyruvate	0.5
Chromogen	0.2
Agar	10.0

Final pH (at 25°C) 7.4 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 88 grams in 1000 ml distilled water. Heat to boiling to dissolve the medium completely. Mix well. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool the medium to 50°C and pour into sterile petri plates.

Principle and Interpretation

HiCrome M-Lauryl Sulphate Agar is a modification of the Lauryl tryptose broth, formulated by Mallman and Darby, (1). This Chromogenic medium is recommended for the presumptive identification and differentiation of *E. coli* and other coliforms by a single membrane filtration technique (2,3). The incorporation of chromogen X-glucuronide and the dye phenol red favours the differentiation of *E. coli* and other coliforms on the basis of colour.

Peptic digest of animal tissue and yeast extract provide essential growth nutrients to the organisms. Lactose acts as a source of fermentable sugar Sodium Lauryl Sulphate inhibits organisms other than coliforms. The enzyme β-glucuronidase produced by *E. coli*, cleaves X-glucuronide, imparting a green colour to the colonies and alongwith phenol red indicator aids in detection of lactose fermenters.

Quality Control

Appearance of Powder	:	Beige coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.0% Agargel.
Colour and Clarity	:	Red coloured, clear to slightly opalescent gel forms in petriplates.
Reaction	:	Reaction of 8.8% w/v aqueous solution is pH 7.4 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics observed after an incubation at 37°C for 24 hours.

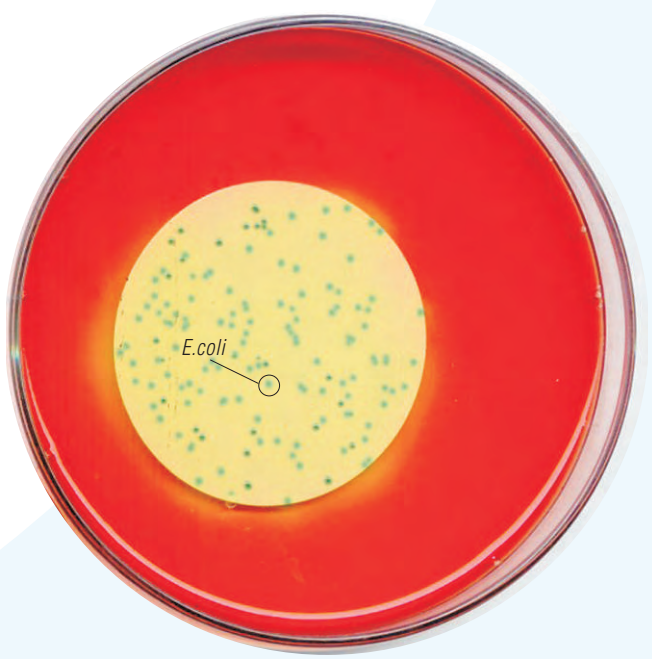
Organisms (ATCC)	Growth	Colour of Colony
E. coli (25922)	luxuriant	green
K. pneumoniae (13883)	good	yellow, mucoid
S. aureus (25923)	inhibited	-
*S. s*erotype Enteritidis (13076)	good	pink

References

1. Mallman and Darby, 1941, Am. J. Public Health, 31:127.
2. Sartory D.P. and Howard L, 1992, Lett Appl. Microbiol. 15:273-276.
3. Methods for Examination of Waters and Associated Materials, Environment Agency, 1998, Standing Committee of Analysts.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1569

HiCrome E. coli Agar

For the chromogenic detection enumeration and confirmation of *Escherichia coli* in food and water samples

M1295 / M1295I

HiCrome *E.coli* Agar is recommended for the detection enumeration, confirmation of *Escherichia coli* in food and water samples. This medium can also be used in membrane filtration technique.

Composition **	M1295	M1295I
Ingredients	**Grams/Litre**	**Grams/Litre**
Casein enzymic hydrolysate	14.00	20.00
Peptone, special	5.00	—
Bile salts mixture	1.50	1.50
Disodium hydrogen phosphate	1.00	—
Sodium dihydrogen phosphate	0.60	—
Sodium chloride	2.40	—
X-Glucuronide	0.075	0.075
Agar	12.00	15.00

Final pH (at 25°C) 7.2 ± 0.2
** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 36.58 grams in 1000 ml distilled water. Heat to boilling to dissolve the medium completly. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 50°C and pour into sterile petri plates.

Principle and Interpretation

HiCrome E. coli Agar is based on Tryptone Bile Agar to detect *Escherichia coli* in foods (1) where recovery of *Escherichia coli* is faster, more reliable and accurate.

Most of the *Escherichia coli* strains can be differentiated from other coliforms by the presence of enzyme glucuronidase which is highly specific for *Escherichia coli* (2). The chromogenic agent X-glucuronide used in this medium helps to detect glucuronidase activity. *Escherichia coli* cells absorb X-glucuronide and the intracellular glucuronidase splits the bond between the chromophore and glucuronide. The released chromophore gives bluish green colouration to the colonies.

Casein enzymic hydrolysate and peptone special provide the essential growth nutrients to the organisms. Bile salts mixture inhibits gram-positive organisms. Sodium chloride and phosphates maintain osmotic balance and buffering action respectively.

Dry the surface of the medium before use. Dilute food samples 1:5 or 1:10 with 0.1% (w/v) sterile Peptone Water (M028) and homogenize in a blender or a stomacher. Pipette 0.5 ml or 1.0 ml of the homogenized food sample on to the plate and spread with a sterile glass spreader. Incubate the plates at 30°C for 4 hours and then at 44°C for 18 hours.

Quality Control

Appearance of powder	:	Beige coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable to 1.2% of M1295 or 1.5% of M1295I Agar gel.
Colour and Clarity	:	Light yellow coloured, clear to slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 3.66% w/v aqueous solution is pH 7.2 ± 0.2 at 25°C.

Cultural Response : Cultural characteristics after 18-24 hours at 44°C.

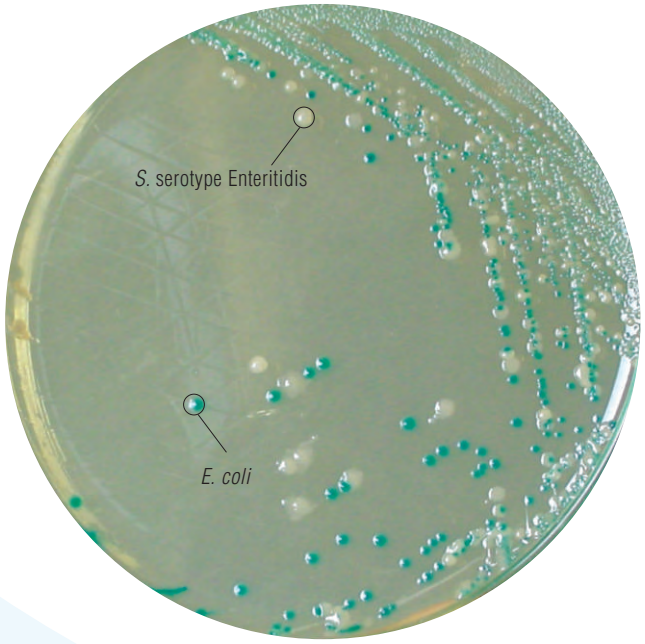
Organisms (ATCC)	Growth	Colour of colony
E. coli (25922)	luxuriant	bluish green
S. serotype Enteritidis (13076)	luxuriant	colourless
S. aureus (25923)	inhibited	—

References

1. Anderson J.M. and Baird-Parker A.C., (1975), J. Appl. Bact., 39:111.
2. Hansen W. and Yourassawsky E., (1984), J. Clin. Microbiol., 20:1177.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1295

HiCrome M-TEC Agar

For detection of Thermotolerant *Escherichia coli* in water by the membrane filtration technique.

M1571

HiCrome M-TEC Agar is recommended by the U.S. Environmental Protection Agency (USEPA) for detection of Thermotolerant *Escherichia coli* in water by the membrane filtration technique.

Composition **

Ingredients	Grams/Litre
Proteose peptone	5.0
Yeast extract	3.0
Lactose	10.0
Sodium chloride	7.5
Dipotassium phosphate	3.3
Monopotassium phosphate	1.0
Sodium lauryl sulphate	0.2
Sodium deoxycholate	0.1
Chromogen	0.5
Agar	15.0

Final pH (at 25°C) 7.3 ± 0.2

** Formula adjusted, standardized to suit perforance parameters

Directions

Suspend 45.6 grams in 1000 ml distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 45°C and pour into sterile petri plates.

Principle and Interpretation

HiCrome M-TEC Agar is a chromogenic medium used for detection and enumeration of thermotolerant *E. coli* (TEC) in water by membrane filtration technique (1). It is a modification of the M-TEC Agar developed by Dufour (2). The modified medium contains the chromogen, X-glucuronide that is cleaved by the enzyme β-glucuronidase to yield glucuronic acid, produced by *E.coli* strains. This selectively imparts a purple-magenta colour to the colonies of *E. coli*.

Proteose peptone and yeast extract provides essential nutrients. Lactose is the fermentable carbohydrate. Sodium chloride maintains osmotic equilibrium. Monopotassium phosphate and dipotassium phosphate provide strong buffering system to control the pH in the presence of fermentative action. Sodium lauryl sulphate and Sodium deoxycholate make the medium more selective by inhibiting gram positive bacteria.

Quality Control

Appearance of Powder	:	Light yellow coloured, homogeneous, freeflowing powder.
Gelling	:	Firm, comparable with 1.5% Agar gel.
Colour and Clarity	:	Light amber coloured clear to slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 4.56% w/v aqueous solution is pH 7.3 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics observed after an incubation of 22 - 24 hours at 44.5 ± 0.2°C.

Organisms (ATCC)	Growth	Colour of Colony
E. coli (25922)	good to luxuriant	purple / magenta
E. faecalis (29212)	inhibited	-
K. pneumoniae (13883)	good	colourless-tan
P. mirabilis (25933)	good	colourless-light brown

References

1. U.S. Environmental Protection Agency, 2002, Method 1603; Publication EPA-821-R-02-023.
2. Dufour, Stricklandand Cabelli, 1981, Appl. Environ. Microbiol. 41: 1152.

Storage and Shelf-life

Store at 2- 8°C in tightly capped container. Use before expiry date on the label.

M1571

HiCrome MacConkey Sorbitol Agar Base

M1340

For selective isolation of *Escherichia coli 0157:H7* from food and animal feeding stuffs.

HiCrome MacConkey Sorbitol Agar is recommended for selective isolation of *Escherichia coli 0157:H7* from food and animal feeding stuffs.

Composition **

Ingredients	Grams/Litre
Casein enzymic hydrolysate	17.00
Proteose peptone	3.00
Sorbitol	10.00
Bile salts mixture	1.50
Sodium chloride	5.00
Crystal violet	0.001
Neutral red	0.03
B.C. Indicator	0.10
Agar	13.50

Final pH (at 25°C) 7.1 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 25.06 grams in 495 ml distilled water. Boil gently to dissolve the medium completely. DO NOT AUTOCLAVE. Cool to 50°C. Mix well and pour into sterile petri plates. If desired, rehydrated contents of 1 vial of Tellurite Cefixime Supplement (FD147) may be added aseptically to 495 ml sterile molten, cooled (50°C) medium before pouring into sterile petri plates.

Principle and Interpretation

Sorbitol MacConkey Agar is based on the formulation described by Rappaport and Henigh (1). The medium contains sorbitol instead of lactose and it is recommended for the detection of enteropathogenic strains of *Escherichia coli 0157:H7* which ferments lactose but does not ferment sorbitol (2) and hence produce colourless colonies. *Escherichia coli 0157:H7* has been recognised as a cause of haemorrhagic colitis (3). March and Ratnam (2) reported that the detection of *Escherichia coli 0157:H7* had a sensitivity of 100% and specificity of 85% on Sorbitol MacConkey Agar and they recommended this medium as reliable means of screening *Escherichia coli 0157:H7*. B.C. indicator is added to detect the presence of an enzyme ß-Dglucuronidase which is specific for *Escherichia coli* (4). Strains of *Escherichia coli* fermenting sorbitol and possessing ß-glucuronidase appear as blue-green coloured colonies on the medium. Enteropathogenic strains of *Escherichia coli 0157:H7* do not possess ß-glucuronidase activity (5) and thusproduce colourless colonies.

Casein enzymic hydrolysate and proteose peptone provide carbonaceous, nitrogenous and other essential growth nutrients. Most of the gram-positive organisms are inhibited by crystal violet and bile salts. Sodium chloride maintains the osmotic equilibrium.

Addition of Tellurite-Cefixime Supplement (FD147) makes the medium selective (6). Potassium Tellurite selects the serogroups 0157 from other *E. coli* sero groups and inhibits *Aeromonas* and *Providencia* species. Cefixime inhibits *Proteus* species. *Pseudomonas* if present, produces colourless colonies on this medium. For confirmation oxidase test may be performed with suspected colonies and results should be noted within 5-10 seconds.

Quality Control

Appearance of powder	:	Pinkish beige coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.35% Agar gel.
Colour and Clarity	:	Purplish red coloured gel forms in petri plates.
Reaction	:	Reaction of 5.01% w/v aqueous solution is pH 7.1 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics after 24 hours (48 hours if necessary) at 35 - 37°C.

Organisms (ATCC)	Growth	*Colour of colony	Oxidase
E. coli 0157:H7	good-luxuriant	colourless	—
E. coli (25922)	good	blue-green	—
P.aeruginosa (27853)	poor-good	colourless	+
K. pneumoniae (13883)	good	pink-red	—

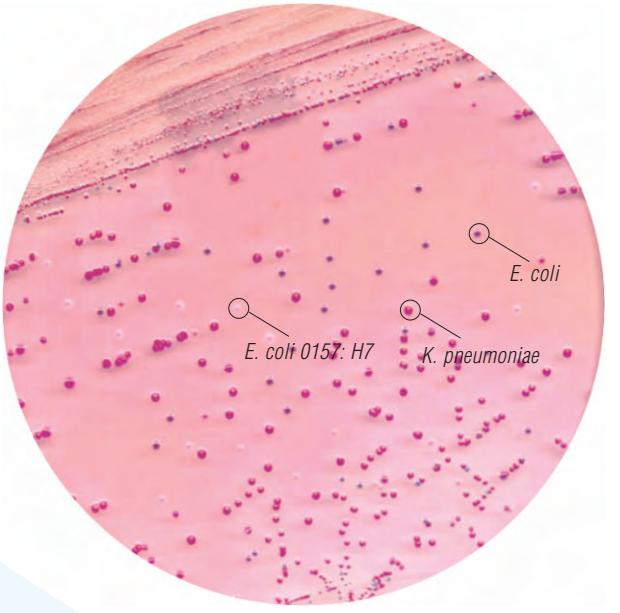
Key : * = Colour of the colony without addition of Tellurite-Cefixime Supplement (FD147), + = positive reaction, — = negative reaction.

References

1. Rappaport F. and Henigh E., (1952), J. Clin. Path., 5:361.
2. March S.B. and Ratnam S., (1986) : J. Clin. Microbiol. 23, 869-872.
3. Karmali M.A., Petric M., Lim C., et al, (1985), J. Infect. Dis., 151-775.
4. Hansen W. and Yourassawsky E., (1984), J. Clin. Microbiol., 20:1177.
5. Thompson et al. (1990). J. Clin. Microbiol. 29, 2165-2168.
6. Zadik P.M., Chapman P.A. and Siddons C.A., (1993), J. Med. Microbiol., 39, 155-158.

Storage and Shelf-life

Store at 2- 8°C in tightly capped container. Use before expiry date on the label.



M1340

HiCrome EC 0157: H7 Agar

For isolation and differentiation of *E. coli* 0157 from food and environmental samples.

M1574

HiCrome EC 0157:H7 Agar is a chromogenic medium for isolation and differentiation of *E. coli* 0157 from food and environmental samples.

Composition**

Ingredients	Grams/Litre
Casein enzymic hydrolysate	8.00
Sorbitol	7.00
Bile salts mixture	1.50
SLS	0.10
Chromogenic mixture	0.25
Agar	12.00

Final pH (at 25°C) 6.8 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 28.85 grams in 1000 ml distilled water. Heat to boiling to dissolve the medium completely. DO NOT AUTOCLAVE. Cool to 50°C and pour into sterile petriplates. This medium can be made more selective by aseptically adding 0.25 ml of 1% potassium tellurite solution (FD052) to 1000 ml molten and cooled medium (45°C).

Principle and Interpretation

HiCrome EC 0157: H7 Agar is based on the formulation described by Rappaport and Henigh (1). The medium contains sorbitol and a proprietary chromogenic mixture instead of lactose and indicator dyes respectively. The chromogenic substrate is specifically and selectively cleaved by *Escherichia coli* 0157: H7 resulting in a dark purple to magenta coloured moeity. *Escherichia coli* gives light pink-mauve coloured colonies.

Casein enzymic hydrolysate provides carbonaceous, nitrogenous and growth nutrients. Sodium chloride maintains osmotic equilibrium. Bile salts mixture and SLS inhibits gram positive organisms.

Quality Control

Appearance of Powder: Light yellow coloured, homogeneous, free flowing powder.

Gelling : Firm, comparable with 1.2% Agar gel.

Colour and Clarity : Light amber coloured, clear to slightly opalescent gel forms in petri plates.

Reaction : Reaction of 2.88% w/v aqueous solution is pH 6.8 ± 0.2 at 25°C.

Cultural Response : Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

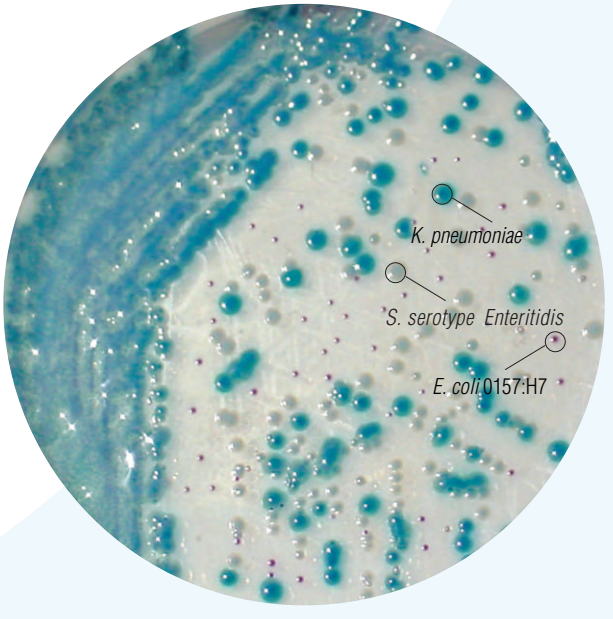
Organisms (ATCC)	Growth	Colour of Colony
B. subtilis (6633)	inhibited	—
E. coli 0157:H7 (NCTC 12900)	luxuriant	dark purple- magenta
E. coli (25922)	luxuriant	light pink- mauve
K. pneumoniae (13883)	luxuriant	blue, mucoid
P. aeruginosa (27853)	luxuriant	colourless
S. aureus (25923)	inhibited	—
S. serotype Enteritidis (3076)	luxuriant	light greenish blue

References

1. Rappaport F. and Henigh E. (1952), J. Clin. Path., 5:361.
2. Zadik P.M., Cahpman P.A. and Siddons C.A. (1993) J. Med. Microbiol., 39,155-158.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1574

HiCrome EC 0157:H7 Selective Agar Base

Recommended for selective isolation and easy detection of *Escherichia coli* 0157:H7 from food samples.

M1575

HiCrome EC 0157:H7 Selective Agar Base is recommended for selective isolation and easy detection of *Escherichia coli* 0157:H7 from food samples.

Composition**

Ingredients	Grams/Litre
Casein enzymic hydrolysate	8.00
Sorbitol	7.00
Bile salts mixture	1.50
SLS	0.10
Chromogenic mixture	0.25
Agar	15.00

Final pH (at 25°C) 6.8 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 31.85 grams in 990 ml distilled water. Heat to boiling to dissolve the medium completely. DO NOT AUTOCLAVE. Cool to 50°C. Add rehydrated contents of 1 vial of HiCrome EC 0157:H7 Selective Supplement (FD187) aseptically. Mix well and pour into sterile petriplates.

Principle and Interpretation

HiCrome EC 0157:H7 Agar is based on the formulation described by Rappaport and Henigh (1). The medium contains sorbitol and a proprietary chromogenic mixture instead of lactose and indicator dyes respectively. The chromogenic substrate is specifically and selectively cleaved by *Escherichia coli* 0157:H7 resulting in a dark purple to magenta coloured moeity. *Escherichia coli* gives light pink to mauve coloured colonies.

Casein enzymic hydrolysate provides carbonaceous, nitrogenous and growth nutrients. Sodium chloride maintains osmotic equilibrium. Addition of HiCrome EC 0157:H7 Selective Supplement (FD187) makes the medium selective (2). Potassium tellurite selects the serogroups and inhibits *Aeromonas* species and *Providencia* species. Novobiocin inhibits gram-positive bacteria.

Quality Control

Appearance of Powder	:	Light yellow coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.5% Agar gel.
Colour and Clarity	:	Light amber coloured, clear to slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 3.18% w/v aqueous solution is pH 6.8 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours with added FD187 (HiCrome EC 0157:H7 Selective Supplement).

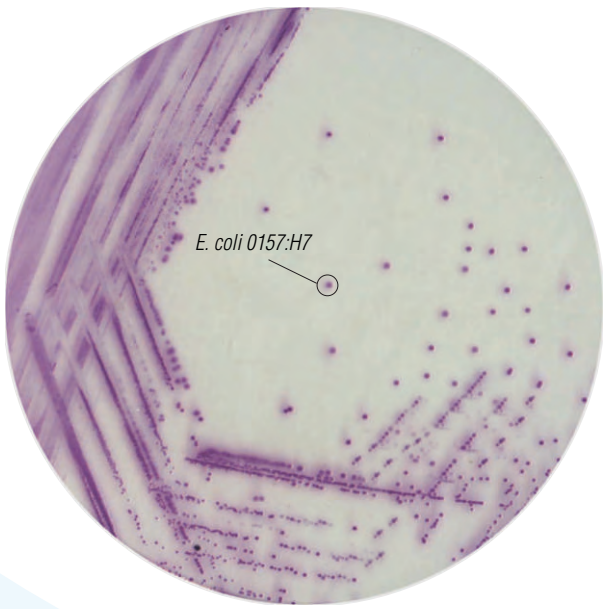
Organisms (ATCC)	Growth	Colour of Colony
E. coli 0157:H7 (NCTC 12900)	luxuriant	dark purple-magenta
E. coli (25922)	none to poor	light pink- mauve
K. pneumoniae (13883)	inhibited	-
Ps. aeruginosa (27853)	poor to good	colourless

References

1. Rappaport F. and Henigh E. (1952), J. Clin. Path., 5:361.
2. Zadik P.M., Cahpman P.A. and Siddons C.A. (1993) J. Med. Microbiol., 39, 155-158.

Storage and Shelf-life

Store at 2- 8°C in tightly capped container. Use before expiry date on the label.



M1575

HiCrome Enrichment Broth Base for Ec0157:H7

HiCrome Enrichment Broth Base for *E.coli* 0157:H7 is recommended for isolation and selective differentiation of *E. coli* 0157:H7 from food and environmental samples

M1598

HiCrome Enrichment Broth Base for *E.coli* 0157:H7 is recommended for isolation and selective differentiation of *E. coli* 0157:H7 from food and environmental samples by chromogenic method.

Composition**

Ingredients	Grams/Litre
Casein enzymic hydrolysate	10.0
Sorbitol	10.0
Bile salts mixture	1.5
Chromogenic mixture	1.3

Final pH (at 25°C) 7.1 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 11.4 gms in 500 ml distilled water. Heat to boiling to dissolve the medium completely.DO NOT AUTOCLAVE. For selective isolation of *E.coli* 0157:H7 aseptically add contents of 1vial of HiCrome Ec 0157:H7 Selective Supplement I (FD230) to 495 ml of medium. Mix well and dispense into sterile test tubes.

Principle and Interpretation

March and Ratnam (1) reported the inability of *Escherichia coli* 0157:H7 to ferment sorbitol while developing Sorbitol MacConkey medium. Subsequently Thomson et al. (2) observed the absence of ß-glucoronidase activity in *Escherichia coli* 0157 :H7 from a variety of samples by direct culture. The bluish colour development of *E. coli* and *Klebsiella* in the medium is due to enzyme ß-D-galactosidase and ß-glucoronidase which cleaves the chromogenic substrates present in chromogenic mixture and *E. coli* 0157 :H7 gives purple colour to the medium due to the absence of ß-glucoronidase and inability to ferment sorbitol.

Casein enzymic hydrolysate provides nitrogenous, carbonaceous compounds and other essential growth nutrients. Sorbitol is a fermentable sugar, bile salt mixture inhibits most of the gram positive organisms. Addition of tellurite (FD230) makes the medium more specific and selective.

Quality Control

Appearance of Powder : Light yellow coloured, homogeneous, free flowing powder.

Colour and Clarity : Light amber coloured, clear solution without any precipitate.

Reaction : Reaction of 2.28% w/v aqueous solution is pH 7.1 ± 0.2 at 25°C.

Cultural Response : Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

Organisms (ATCC)	Growth	Growth*	Colour of Medium	Colour of Medium**
E. coli (25922)	luxuriant	inhibited	blue#	-
E. coli 0157: H7 (NCTC 12900)	luxuriant	luxuriant	purple#	purple#
E. faecalis (29212)	inhibited	inhibited	-	-
E. sakazakii (12868)	luxuriant	none-poor	white#	colourless#
K. pneumoniae (13883)	luxuriant	good	bluish -green	# bluish green#
S. aureus (25923)	inhibited	inhibited	-	-
S. serotype Enteritidis (13076)	luxuriant	good	light green#	light green#
Sh. flexneri (12022)	good	inhibited	colourless	-

KEY : * = growth observed after addition of FD230
** = colour of the medium observed after addition of FD230
# = may show slight precipitation of growth

References

1.March S. B. and Ratnam S., (1986), J. Clin. Microbiol. 23, 869 - 872.
2.Thompson et al. (1990), J. Clin. Microbiol. 29, 2165 - 2168

Storage and Shelf-life

Store below at 2-8°C. Use before expiry date on the label.

M1598

1. Control
2. *E coli 0157:H$_7$*
3. *E coli*
4. *Ent. sakazakii*
5. *K. pneumoniae*

HiCrome UTI Selective Agar

For selective identification, differentiation and confirmation of enteric bacteria from specimens such as urine, which may contain large number of *Proteus* species.

M1505

HiCrome UTI selective agar is chromogenic selective media for identification, differentiation and confirmation of enteric bacteria from clinical samples such as urine, which may contain large number of *Proteus* species.

Composition**

Ingredients	Grams/Litre
Peptic digest of animal tissue	18.00
Casein enzymic hydrolysate	4.00
Beef extract	6.00
Bile salt	1.50
Chromogenic mixture	12.44
Agar	15.00

Final pH (at 25°C) 7.2 ± 0.2

* Formula adjusted, standardized to suit performance parameters.

Directions

Suspend 56.94 grams in 1000 ml distilled water. Boil gently to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 50°C and pour into sterile petri plates.

Principle and Interpretation

HiCrome UTI selective Agar is formulated on the basis of work carried out by Pezzlo (1), Wilkie *et al.* (2), Friedman *et al.* (3), Murray *et al* (4), Soriano and Ponte (5) and Merlino *et al* (6). This medium is a modification of HiCrome UTI Agar (M1418), which can be used in place of MacConkey Agar (M081) for isolation of lactose fermenters and non fermenters. It facilitates and expedites the identification of some gram-negative bacteria and some gram-positive bacteria on the basis of different colony colours produced by reactions of genus or species specific enzymes with two chromogenic substrates.

The chromogenic substrates are cleaved by enzymes produced by *Escherichia coli* and coliforms. Presence of rich source of phenylalanine and tryptophan from peptone and tryptone provides an indication of tryptophan deaminase activity, revealed with TDA Reagent (R036) indicating the presence of *Proteus* species, *Morganella* species and *Providencia* species, which appear brown. *Escherichia coli* produce magenta colonies due to the enzyme -galactosidase, which cleaves the chromogenic substrate. Further confirmation of *Escherichia coli* can be done by performing indole test using DMACA Reagent (R035). Also, some strains of *Enterobacter cloacae* lacking -glucosidase show pink - colonies indistinguishable from *Escherichia coli*. The DMACA reagent for indole test (should be performed on filter paper) distinguishes between *Escherichia coli* and *Enterobacter*, and also between *Proteus mirabilis* and other species. Coliforms produce blue to purple coloured colonies due to cleavage of both chromogenic substrates. Peptic digest of animal tissue, beef extract and casein enzymic hydrolysate provide nitrogenous, carbonaceous compounds and other essential growth nutrients. The medium becomes more selective due to presence of bile salts that inhibit gram positive bacteria.

Quality Control

Appearance of Powder	:	Light yellow coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.5% Agar gel.
Colour and Clarity	:	Light amber coloured, clear to slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 5.69% aqueous solution is pH 7.2 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics observed after an incubation of 24 hours at 35 - 37°C.

Organisms (ATCC)	Growth	Colour of colony	TDA*	DMACA**
E. coli (25922)	luxuriant	magenta	—	+
E. faecalis (29212)	inhibited	—	—	—
K. pneumoniae (13883)	luxuriant	blue to purple, mucoid	—	—
P. aeruginosa (27853)	luxuriant	colourless	—	—
P. mirabilis (10975)	luxuriant	light brown	+	—
S. aureus (25923)	inhibited	—	—	—

Key : + = Positive reaction, - = Negative reaction

* = Add 1-2 drops of TDA reagent directly on a suspected colony. Development of brown colour around the colony confirms positive reaction.

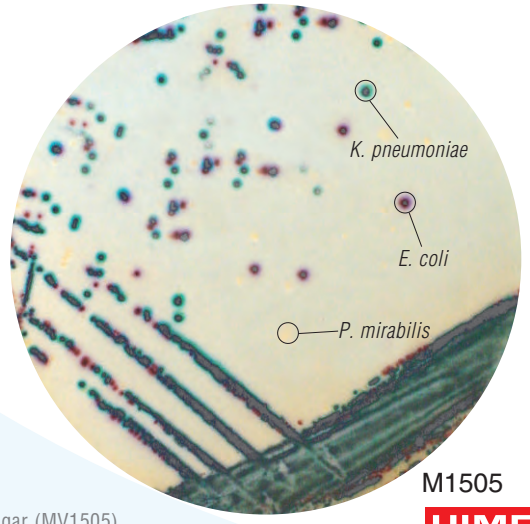
** = Transfer suspected colony on filter paper dipped in DMACA ragent. Development of bluish purple colour on filter paper confirms positive reaction.

References

1. Pezzlo M, (1998), Clinical Microbiology Reviews, 1:268-280
2. Wilkie M.E., Almond M.K. and Marsh F.P., (1992), British Medical Journal, 305:1137-1141.3. Friedman M.P. et al. (1991), Journal of Clinical Microbiology, 29:2385-2389.
4. Murray P., Traynor P. and Hopson D., (1992), Journal of Clinical Microbiology, 30:1600-1601.
5. Soriano F. and Ponte C., (1992), Journal of Clinical Microbiology, 30:3033-3034.
6. Merlino et al. (1995), Abstr. Austr. Microbiol., 16(4):17-3.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1505

HIMEDIA®

HiCrome UTI Agar / Modified

For presumptive identification, differentiation and confirmation of microorganisms mainly causing urinary tract infections. It can also be used for testing water, food, environmental & other clinical samples

M1353 / M1418

HiCrome UTI Agar, media are chromogenic differential media for identification, differentiation and confirmation of enteric bacteria from specimens such as urine which may also contain large number of potentially pathogenic gram-positive organisms. Based on these characteristics HiCrome UTI Agar media are suggested for use in place of MacConkey Agar.

Composition **	M1353	M1418
Ingredients	Grams/Litre	Grams/Litre
Peptone, special	15.00	—
Peptic digest of animal tissue	—	18.00
Casein enzymic hydrolysate	—	4.00
Beef extract	—	6.00
Chromogenic mixture	2.45	12.44
Agar	15.00	15.00
Final pH (at 25°C)	6.8 ± 0.2	7.2 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 32.45 grams of M1353 or 55.44 grams of M1418 in 1000 ml distilled water. Boil gently to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 50°C and pour into sterile petri plates.

Principle and Interpretation

HiCrome UTI Agar media are formulated on the basis of work carried out by Pezzlo (1) Wilkie *et al* (2), Friedman *et al* (3), Murray *et al* (4), Soriano and Ponte (5) and Merlino *et al* (6). This medium is recommended for the detection of urinary tract pathogens as it has broader application as a general nutrient agar for isolation of various microorganisms. It facilitates and expedites the identification of some gram-negative bacteria and some gram-positive bacteria on the basis of different contrasted colony colours produced by reactions of genus or species specific enzymes with two chromogenic substrates. The chromogenic substrates are cleaved by enzymes produced by *Enterococcus* species, *Escherichia coli* and coliforms. Presence of amino acids like phenylalanine and tryptophan from peptones helps for indication of tryptophan deaminase activity, indicating the presence of *Proteus* species, *Morganella* species and *Providencia* species. One chromogenic substrate is cleaved by ß-glucosidase possessed by *Enterococci* resulting in formation of bluish green colonies. *Escherichia coli* produce purple coloured colonies due to the enzyme ß-galactosidase which cleaves the other chromogenic substrate.

Further confirmation of *Escherichia coli* can be done by performing indole test, using DMACA reagent (R035). But, some strains of *Enterobacter cloacae* lacking ß-glucosidase show pink - colonies indistinguishable from *Escherichia coli*. The indole test (performed on filter paper) help to distinguish *Escherichia coli* from other organisms. Coliforms produce blue to purple coloured colonies due to cleavage of both the chromogenic substrates.

Peptic digest of animal tissue, beef extract and casein enzymic hydrolysate provides nitrogenous, carbonaceous compounds and other essential growth nutrients.

Quality Control

Appearance of Powder: Light yellow coloured, homogeneous, free flowing powder.

Gelling : Firm, comparable with 1.5% Agar gel.

Colour and Clarity : Light amber coloured, clear to slightly opalescent gel forms in petri plates.

Reaction : Reaction of 3.24% w/v of M1353 aqueous solution is pH 6.8 ± 0.2 or 5.54% w/v of M1418 aqueous solution is pH 7.2 ± 0.2 at 25°C.

Cultural Response : Cultural characteristics at 35-37°C for 24 hours

Organisms (ATCC)	Growth	Colour of colony	TDA	DMACA
E. coli (25922)	luxuriant	purple - magenta	–	+
P. mirabilis (10975)	luxuriant	light brown	+	–
K. pneumoniae (13883)	luxuriant	blue to purple, mucoid	–	–
P. aeruginosa (27853)	luxuriant	colourless	–	–
S. aureus (25923)	luxuriant	golden yellow	–	–
E. faecalis (29212)	luxuriant	blue - green(small)	–	–

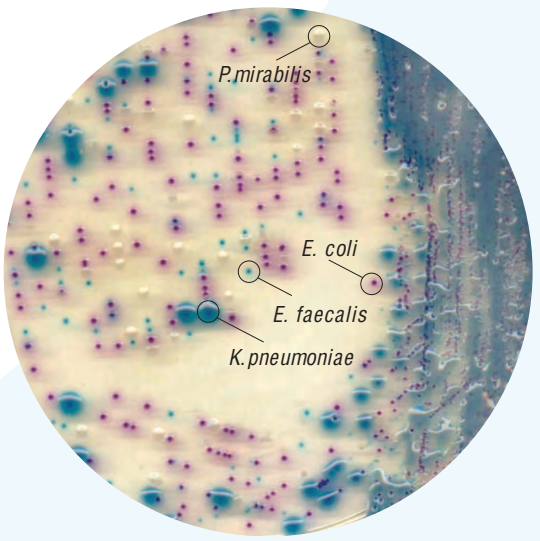
Key : + = positive reaction, – = negative reaction.

References

1. Pezzlo M., (1998), Clinical Microbiology Reviews 1:268-280
2. Wilkie M.E., Almond M.K. and Marsh F.P., (1992), British Medical Journal, 305:1137-1141.
3. Friedman M.P. et al, (1991), Journal of Clinical Microbiology, 29:2385-2389.
4. Murray P., Traynor P. and Hopson D., (1992), Journal of Clinical Microbiology 30:1600-1601.
5. Soriano F. and Ponte C., (1992), Journal of Clinical Microbiology 30:3033-3034.
6. Merlino et al, (1995), Abstr. Austr. Microbiol.,16(4):17-3.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1353

Salmonella Differential Agar / Modified (Twin pack) (RajHans Medium)

For identification and differentiation of *Salmonella* species from members of *Enterobacteriaceae*, especially *Proteus* species.

M1078 / M1082

Salmonella Differential Agar media are recommended for identification and differentiation of Salmonella species from members of *Enterobacteriaceae,* especially Proteus species.

Composition**	M1078	M1082
Ingredients	Grams/Litre	Grams/Litre
Part A :		
Peptone, special	8.00	8.00
Yeast extract	2.00	3.00
Sodium deoxycholate	1.00	1.00
Sodium chloride	—	5.00
B.C. indicator	2.00	2.00
Agar	12.00	12.00
Part B :		
Propylene glycol	10.00	10.00

Final pH (at 25°C) 7.3 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 10 grams of fluid Part B in 1000 ml distilled water. Add 25 grams of Part A (M1078) or 31 grams of Part A (M1082). Mix well and boil to dissolve the medium completely. DO NOT AUTOCLAVE. Cool to 45 - 50°C. Mix well before pouring into sterile petri plates.

Principle and Interpretation

Salmonella Differential Agar media are slight modification of original formulation of Rambach (1) used for differentiation of *Salmonella* species from *Proteus* species and other enteric bacteria. Production of acid from propylene glycol is a novel characteristic of *Salmonella* species and is utilised in these media. Many of the media such as SS Agar, XLD Agar recommended for the identification and differentiation of *Salmonella* species (2) are based on lactose fermentation and hydrogen sulphide production. Peptone special and yeast extract supports the luxuriant growth of bacteria while Sodium deoxycholate inhibits gram-positive organisms rendering the medium selective for enteric microorganisms. The BC indicator turns pink in presence of acid produced from propylene glycol. Lactose fermentating ability is determined by using an indicator which can detect the presence of enzyme ß-galactosidase. Lactose fermenting (ß-galactosidase producing) bacteria yield blue-violet coloured colony (3). *Salmonellae* produce acid from propylene glycol and then after combining with the pH indicator gives typical pink-red colonies. Other enteric gram-negative bacteria forms colourless colonies. *Salmonellae typhimurium* and *Salmonellae enteritidis* produce pink to red colonies.

Quality Control

Appearance of powder : **Part A :** Beige coloured, homogeneous, free flowing powder.
Part B : Colourless, viscous solution.

Gelling : Firm, comparable with 1.2% Agar gel.

Colour and Clarity : Light orange coloured, clear to slightly opalescent gel forms in petri plates.

Reaction : Reaction of 2.50% w/v Part A of M1078 or 3.1% w/v Part A of M1082 aqueous solution is pH 7.3 ± 0.2 at 25°C.

Cultural Response : Cultural characteristics after 24 - 48 hours at 35 - 37°C.

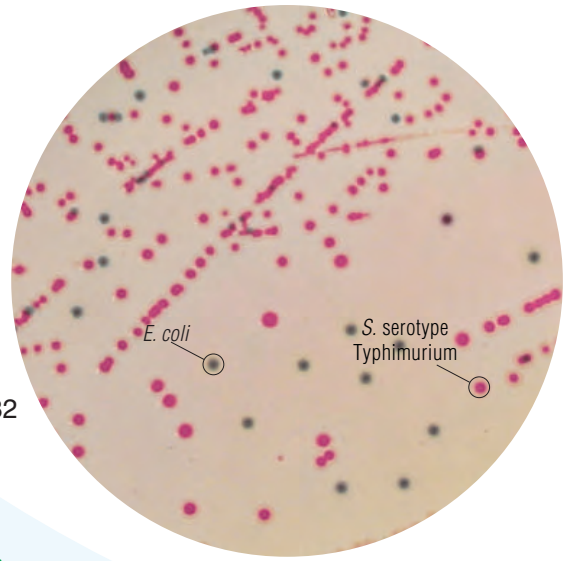
Organisms (ATCC)	Growth	Colour of colony
S. serotype Enteritidis (13076)	luxuriant	pink-red
S. serotype Typhimurium (14028)	luxuriant	pink-red
S. serotype Typhi (6539)	luxuriant	colourless
E. coli (25922)	luxuriant	blue-green
K. pneumoniae (13883)	luxuriant	blue-violet
P. mirabilis (25933)	luxuriant	colourless
Sh. flexneri (12022)	luxuriant	colourless
S. aureus (25923)	inhibited	—

References

1. Rambach A., (1990), Environ. Microbiol., 56:301.
2. Greenberg A. E., Trussel R. R., Clesceri L. S., (Eds.), (1985), Standard Methods for the Examination of Water and Wastewater, 16th ed., APHA, Washington, D.C.
3. Greenwald R., Henderson R.W. and Yappaw S., (1991), J. Clin. Microbiol., 29:2354.

Storage and Shelf-life

Store at 2- 8°C in tightly capped container. Use before expiry date on the label.



M1082

HiCrome Salmonella Agar / HiCrome Improved Salmonella Agar

for the simultaneous detection of Salmonella and *Escherichia coli* from food, water and clinical samples.

M1296 / M1466

HiCrome Salmonella Agar media are selective media used for the simultaneous detection of *Salmonella* and *Escherichia coli* from food, water and clinical samples.

Composition **	M1296	M1466
Ingredients	Grams/Litre	Grams/Litre
Peptic digest of animal tissue	6.00	—
Peptone special	—	8.00
Yeast extract	2.50	2.00
Bile salts mixture	1.00	—
Sodium deoxycholate	—	1.00
Chromogenic mixture	5.40	3.25
Agar	13.00	12.00
Final pH (at 25°C)	7.7 ± 0.2	7.3 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 27.9 grams of M1296 or 26.25 grams of M1466 in 1000 ml distilled water. Boil gently to dissolve the medium completely. DO NOT AUTOCLAVE. Cool to 50°C. Mix well and pour into sterile petri plates.

Principle and Interpretation

HiCrome Salmonella Agar media are modification of the original formulation of Rambach (1) used for differentiation of *Salmonella* species from other enteric bacteria. Rambach formulation differentiates *Salmonella* on the basis of propylene glycol utilization which is rendered visible due to a chromogenic indicator incorporated in the media, but HiCrome Salmonella Agar media uses only a chromogenic mixture to differentiates the same.

Peptic digest of animal tissue / peptone special provides nitrogenous, carbonaceous compounds and other essential growth nutrients. *Escherichia coli* and *Salmonella* are easily distinguishable due to the colony characteristics. *Salmonella* give light purple colonies with a halo on (M1296) and pink-red colonies on (M1466). *Escherichia coli* has a characteristic blue to green colour, due to the presence of enzyme -glucuronidase other organisms give colourless colonies. The characteristic light purple and blue colour is due to the chromogenic mixture (2). Bile salts mixture/ sodium deoxycholate inhibits gram positive organisms.

Quality Control

Appearance of powder	:	Light yellow (M1296) / pinkish yellow (M1466) coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.3% (M1296) / 1.2% (M1466) Agar gel.
Colour and Clarity	:	Light amber (M1296) / reddish pink (M1466) coloured, slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 2.79% w/v of M1296 aqueous solution is pH 7.7 ± 0.2 or 2.62% w/v of M1466 aqueous solution is pH 7.3 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics observed after 24-48 hours at 35 - 37°C.

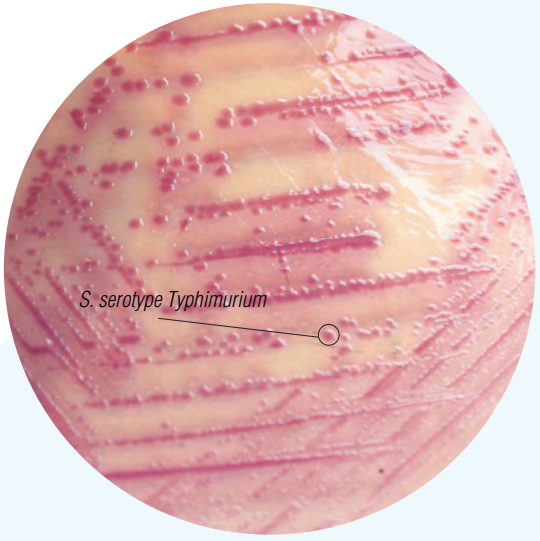
Organisms (ATCC)	Growth	Colour of colony (M1296)	(M1466)
E. coli (25922)	luxuriant	blue-green	blue to purple
S. serotype Enteritidis *(13076)*	luxuriant	light purple with halo	pink to red
S. serotype Typhi *(6539)*	good-luxuriant	light purple with halo	light pink
S. serotype Typhimurium *(14028)*	luxuriant	light purple with halo	pink to red
P. vulgaris (13315)	good	colourless	light brown
S. aureus (25923)	inhibited	—	—
B. subtilis (6633)	inhibited	—	—

References

1. Rambach A., (1990), Environ. Microbiol., 56:301.
2. Greenwald R., Henderson R.W. and Yappan S., (1991), J. Clin. Microbiol., 29:2354.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1296

HiCrome MM Agar

For identification and differentiation of *Salmonella* and non-salmonella like *Citrobacter* from food, water clinical samples.

M1393

HiCrome MM Agar is recommended for identification and differentiation of *Salmonella* and non-salmonella like *Citrobacter* from food, water clinical samples.

Composition **

Ingredients	Grams/Litre
Peptic digest of animal tissue	10.00
Beef extract	2.00
D-Cellobiose	3.00
Lactose	10.00
D-Mannitol	1.20
D-Trehalose	1.33
Chromogenic mixture	6.60
Agar	15.00

Final pH (at 25°C) 7.6 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 49.13 grams in 1000 ml distilled water. Heat to boiling to dissolve the medium completely. DO NOT AUTOCLAVE OR OVERHEAT. Cool to 45-50°C and pour into sterile petri plates.

Principle and Interpretation

HiCrome MM Agar was formulated by Miller and Mallinson (1) for specific isolation and detection of *Salmonellae*. This medium is superior to XLT4 Agar in supporting growth of *Salmonella* due to the presence of appropriate proportion of four sugars. Most differential and selective media are formulated with one or more sugars and pH indicators respectively. The utilization of sugars by organisms results in pH-changes. This is used as a means of distinguishing *Salmonella* from competing bacteria on the basis of colony colour. *Salmonella* usually are unable to ferment these sugars (2) which support growth of competing bacteria. Thus other bacteria tend to overgrow *Salmonellae*, masking their presence. The inclusion of sugars like Mannitol, Cellobiose and Trehalose stimulate better initial growth of *Salmonella* cells. However, low concentrations of these sugars do not interfere with the utilization of protein and H_2S production. Presence of lactose suppresses H_2S production by non-salmonellae like *Citrobacter freundii*.

A chromogenic mixture present in this medium helps to differentiate between lactose fermenters and nonfermenters. Lactose fermenters give bluish green coloured colonies which would have been impossible to differentiate with an indicator based on pH change. Inclusion of tergitol 4 in the medium suppresses the presence of *Proteus* and *Providencia* colonies. Peptic digest of animal tissue and beef extract provide essential nitrogen compounds.

Quality Control

Appearance of powder	:	Yellow coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.5% Agar.
Colour and Clarity	:	Light amber coloured, clear solution .
Reaction	:	Reaction of 4.91% w/v aqueous solution is pH 7.6 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics after 18-24 hours at 35-37°C.

Organisms (ATCC)	Growth	Colour of colony
E. coli (25922)	luxuriant	greenish blue
S. serotype Enteritidis (13076)	luxuriant	black centered
S. serotype Typhimurium (14028)	luxuriant	black centered
C. freundii (8090)	good	colourless*
E. faecalis (29212)	Inhibited	—

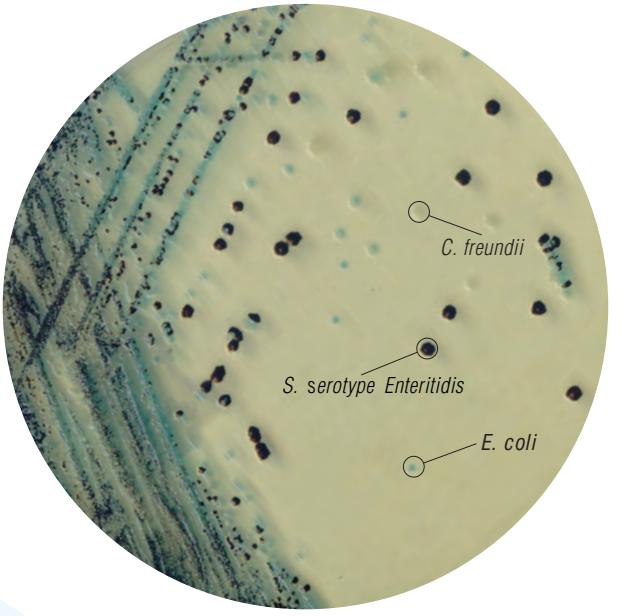
* May show bluish green colour on prolonged incubation.

References

1. Miller R.G. and Mallinson E.T., (2000), J. Food Protection, 63 (10), 1443-46.
2. Miller R.G., Tate C.R., Mallinson E.T. and Scherrer J.A., (1991), Pault SA, 70 : 2429-32.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1393

HiCrome Enterococci Agar / Broth

For identification and differentiation of *Enterococci* from water samples.

M1414 / M1376

HiCrome Enterococci media is used for rapid and easy identification and differentiation of *Enterococci* from water sample.

Composition **	M1414	M1376
Ingredients	Grams/Litre	Grams/Litre
Peptone, special	10.00	10.00
Sodium chloride	5.00	5.00
Sodium azide	0.30	0.30
Chromogenic mixture	0.06	0.04
Polysorbate 80	2.00	2.00
Disodium hydrogen phosphate	1.25	1.25
Agar	15.00	–

Final pH (at 25°C) 7.5 ± 0.2
** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 33.61 grams of M1414 or 18.59 grams (single - strength) or 37.18 grams (double - strength) of M1376 in 1000 ml distilled water. Boil to dissolve the medium completely. Dispense as desired and sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes.

Warning : Sodium azide has a tendency to form explosive metal azides with plumbing material. It is advisable to use enough water to flush off the disposables.

Principle and Interpretation

HiCrome Enterococci Media are formulated on the basis of work carried out by Althous *et al* (1), Amoras (2), Litsky *et al* (3), Manafi and Sommer (4) and Snyder and Lichstein (5). These Media are recommended for rapid detection of *Enterococci* from water samples. The presence of *Enterococcus* group, which is a subgroup of the faecal *Streptococci*, serves as a valuable bacterial indicator for determining the extent of faecal contamination (1, 6) and it is more specific than the detection of coliforms, which may originate from non-faecal sources The enzyme ß-glucosidase produced by *Enterococci* cleaves the chromogenic substrate, resulting in an intensive bluish green colour .

The medium contains special peptone, which provides nitrogenous compounds and other essential nutrients. Sodium chloride maintains the osmotic balance of the medium. Sodium azide inhibits the accompanying microflora, especially gram negative organisms. Polysorbate 80 acts as a source of fatty acids.

Quality Control

Appearance of powder : Light yellow coloured, homogeneous, free flowing powder.

Gelling : Firm, comparable with 1.5% Agar gel of M1414.

Colour and Clarity : Light yellow coloured, clear to slightly opalescent gel / solution forms in petri plates / tubes .

Reaction : Reaction of 3.36% w/v of M1414 and 1.85% w/v of M1376 aqueous solution is pH 7.5 ± 0.2 at 25°C.

Cultural Response : Cultural characteristics observed after an incubation of 24-48 hours at 35 - 37°C

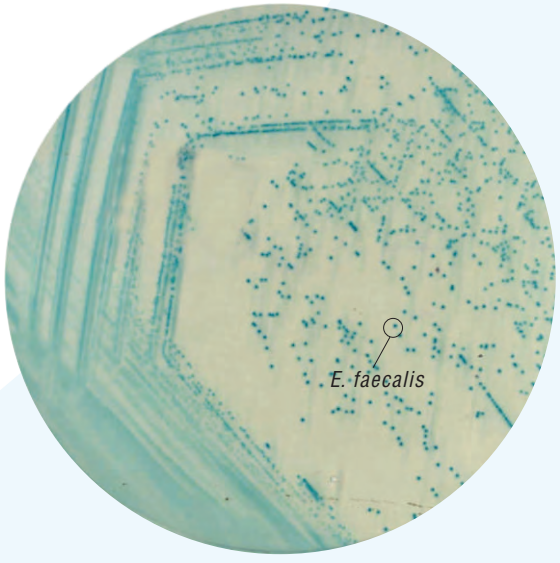
Organism (ATCC)	Growth	Colour of colony
Enterococcus faecalis (29212)	good	blue green
Staphylococcus aureus (25923)	good	colourless
Escherichia coli (25922)	none to poor	—
Pseudomonas aeruginosa (27853)	none to poor	—

References

1. Althous H., Dott W., Havemeister G., Muller H.E. and Sacre' C., (1982), Zbl. Bakt. Hyg. I. Abt. Orig. A., 252:154-165.
2. Amoras I., (1995), Poster Presentation Congress of Spanish Society of Microbiology, Madrid.
3. Litsky W., Mallmann W.L. and Fifield C.W., (1953), Amer. J. Pbl. Hlth., 43:873-879.
4. Manafi M. and Sommer R., (1993), Wat. Sci. Tech., 27:271-274.
5. Snyder M.L. and Lichstein H.C., (1940), J. Infect. Dis., 67:113-115.
6. Standard Methods for the Examination of Water and Wastewater, 20th Edition, Edited by L.S. Clesceri, A.E. Greenberg and A.D. Eaton, Published by APHA, AWWA and WEF (1998).

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1414

HiCrome Ent. faecium Agar Base

Recommended for the chromogenic differentiation of *Enterococcus faecium* from faeces, sewage and water supplies.

M1580

HiCrome Ent. faecium agar is recommended for the chromogenic differentiation of *Enterococcus faecium* from faeces, sewage and water supplies.

Composition**

Ingredients	Grams/Litre
Peptone, special	23.0
Corn starch	1.0
Sodium chloride	5.0
Chromogenic substrate	0.1
Arabinose	10.0
Phenol red	0.1
Agar	15.0

Final pH (at 25°C) 7.8 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 27.1 grams in 500 ml distilled water. Heat to boiling to dissolve the medium completely. DO NOT AUTOCLAVE. Cool to 45-50°C and aseptically add the rehydrated contents of 1 vial of Ent. faecium Selective Supplement (FD226). Mix well and pour into sterile petri plates.

Principle and Interpretation

HiCrome Ent. faecium agar is recommended for the chromogenic detection of *Enterococcus faecium* from urine, faeces, soil, food, water, plants and animals. *E. faceium* is also commonly found in the gastrointestinal tracts of humans (1). The resistance exhibited by *Enterococcus* species to various antimicrobials have led them to being a major cause of human infections including nosocomial infections (2). *E. faecalis* causes 80-90% of infection while *E. faecium* causes the majority of the remainder (3). The use of selective media for the isolation of *Enterococci* has been previously reviewed, including those containing chromogenic substrates (4) and media containing cephalexin-aztreonam supplements. *Enterococcus* species possess the enzyme ß-glucosidase which specifically cleaves the chromogenic substrate to produce blue coloured colonies. *E.faecium* ferment arabinose; and cleaves the chromogenic substrate present in the media to produce green coloured colonies along with yellow colouration to the medium. *E. faecalis* does not ferment arabinose and therefore retains the blue colour.

Peptone special serves as a source of carbon, nitrogen and essential growth nutrients. Corn starch neutralizes the toxic metabolites, sodium chloride maintains the osmotic equilibrium. Phenol red serves as a pH indicator with arabinose being the fermentable carbohydrate.

Quality Control

Appearance of Powder	:	Pinkish beige coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.5% Agar gel.
Colour and Clarity	:	Red coloured, clear to slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 5.42% w/v aqueous solution is pH 7.8 ± 0.2 at 25°C.
Cultural Response	**:**	Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours with added Ent. faecium Selective Supplement (FD226).

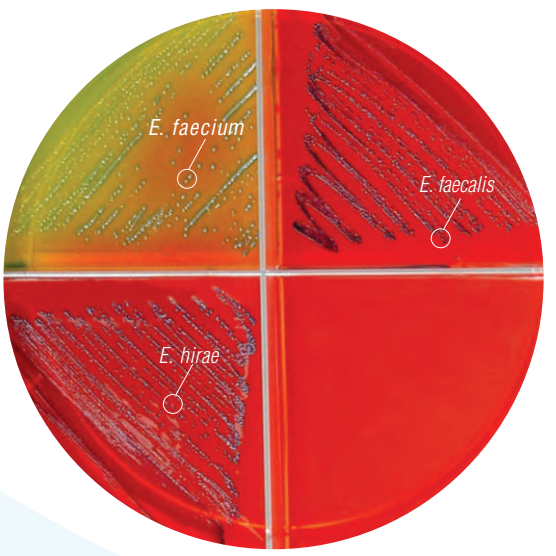
Organisms (ATCC)	Growth	Colour of Colony
E. coli (25922)	inhibited	-
E. faecalis (29212)	luxuriant	blue
E. faecium (19434)	luxuriant	green
E. hirae (10541)	luxuriant	blue
Ps. aeruginosa (27853)	inhibited	-
S. aureus (25923)	inhibited	-

References

1.Mead, G.C. 1978. Streptococci in the intestinal flora of man and other non -ruminant animals, p. 245 261. In F. A. Skinner and L. B. Quesnel (ed.), Streptococci. Academic Press, Inc. (London)Ltd., London, United Kingdom.
2.Chenoweth C, Schaberg D: The epidemiology of enterococci. Eur J Clin Micorbiol Infect Dis 9:80-89, 1990.
3.Moellering. 1992. Clin. Infect. Dis. 14: 1173.
4.Willinger, B., and M. Manafi.1995. Evaluation of new chromogenic agar medium for the identification of urinary tract pathogens. Lett. Appl. Microbiol. 20: 300- 302.

Storage and Shelf-life

Store at 2 - 8°C in tightly capped container. Use before expiry date on the label.



M1580

HIMEDIA®

HiCrome Candida Agar / Modified

For rapid isolation and identification of *Candida* species from mixed cultures.

M1297 / M1456

HiCrome Candida Agar is recommended for rapid isolation and identification of *Candida* species from mixed cultures.

Composition **	M1297	M1456
Ingredients	Grams/Litre	Grams/Litre
Peptic digest of animal tissue	15.00	5.00
Malt extract	—	3.00
Yeast extract	—	3.00
Glucose	—	10.00
Dipotassium hydrogen phosphate	1.00	—
Chromogenic mixture	11.22	2.60
Chloramphenicol	0.50	0.05
Agar	15.00	18.00
Final pH (at 25°C)	6.3 ± 0.2	7.2 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 21.36 of M1297 or 20.83 grams of M1456 in 500 ml distilled water. Boil to dissolve the medium completely. DO NOT AUTOCLAVE. Cool to 50°C and aseptically add, rehydrated contents of 1 vial of HiCrome Candida Selective Supplement (FD192) to M1456. Mix well and pour into sterile petri plates.

Principle and Interpretation

Perry and Miller (1) reported that *Candida albicans* produces an enzyme ß-N-acetylgalactosaminidase and according to Rousselle *et al* (2) incorporation of chromogenic or fluorogenic hexosaminidase substrates into the growth media help in identification of *Candida albicans* isolates directly on primary isolation. HiCrome Candida Agar media are selective and differential medium which facilitates rapid isolation of yeasts from mixed cultures and allows differentiation of *Candida* species namely *Candida albicans, Candida krusei, Candida tropicalis* and *Candida glabrata* on the basis of colouration and colony morphology. On this media results are obtained within 48 hours and it is useful for rapid and presumptive identification of common yeasts in Mycology and Clinical Microbiology Laboratory.

Peptic digest of animal tissue, yeast extract, malt extract and glucose provide nitrogenous, carbonaceous compounds and other essential growth nutrients. Chloramphenicol suppresses bacterial flora. *Candida albicans* produces green coloured smooth colonies. *Candida tropicalis* appear as blue to metallic blue coloured raised colonies. *Candida glabrata* colonies appear cream to white, while *Candida krusei* colonies appear purple coloured fuzzy.

Quality Control

Appearance of powder: Cream coloured, homogeneous, free flowing powder.

Gelling : Firm, comparable with 1.5% (M1297) / 1.8% (M1456) Agar gel.

Colour and Clarity : Light amber coloured clear to slightly opalescent gel forms in petri plates.

Reaction : Reaction of 4.27% w/v of M1297 aqueous solution is pH 6.3 ± 0.2 at 25°C or 4.17% w/v of M1456 aqueous solution is pH 7.2 ± 0.2 at 25°C.

Cultural Response : Cultural characteristics after 24-48 hours at 30°C.

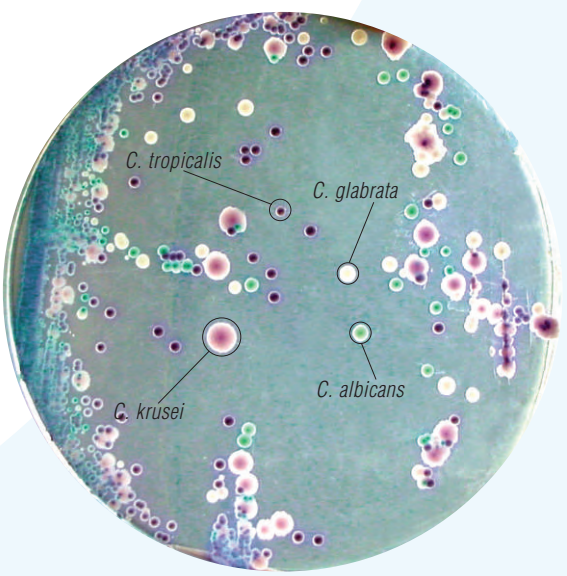
Organisms (ATCC)	Growth	Colour of the colony
C. albicans (10231)	luxuriant	light green
C. tropicalis (750)	luxuriant	blue-metallic blue
C. krusei (24408)	luxuriant	purple, fuzzy
C. glabrata	luxuriant	cream white
E. coli (25922)	inhibited	—
S. aureus (25923)	inhibited	—

References

1. Perry J.L. and Miller G.R., (1987), J. Clini. Microbiol., 25:2424-2425.
2. Rousselle P., Freydiere A., Couillerot P., de Montclos H. and Gille Y., (1994), J. Clin. Microbiol., 32:3034-3036.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1297

HiCrome OGYE Agar Base

For isolation and enumeration of yeasts and moulds from milk and milk products by chromogenic method.

M1467

HiCrome OGYE Agar Base is recommended for isolation and enumeration of yeasts and moulds from milk and milk products by chromogenic method.

Composition **

Ingredients	Grams/Litre
Yeast extract	4.0
Dextrose	20.0
Chromogenic mixture	1.1
Agar	12.0

Final pH (at 25°C) 7.0±0.2

** Formula adjusted, standardized to suit performance parameters.

Directions

Suspend 37.1 grams in 1000 ml distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 50°C and aseptically add reconstituted contents of two vial of Oxytetra Selective Supplement (FD032). Mix well and pour into sterile petri plates.

Principle and Interpretation

OGYE Agar Media were originally formulated by Mossel *et al* (1,2) for the isolation and enumeration of yeasts and moulds from foodstuffs. Mossel *et al* (3) further added Oxytetracycline as a selective agent and found that the use of Oxytetracycline in a medium with a neutral pH gives increased counts of yeasts and moulds as compared to media having a low pH to supress bacterial growth. HiCrome OGYE Agar is a selective and differential medium which facilitates rapid isolation of yeasts and moulds from milk and milk products. Incorporation of chromogenic compounds into the medium helps in identification of yeast and mould isolates directly on primary isolation. Aspergillus niger appear as light blue coloured colonies with black spores. *C. albicans* shows green coloured colonies due to the presence of chromogenic mixture and *S. cerevisiae* gives colourless colonies.

Yeast extract provides essential growth nutrients. Dextrose acts as carbon and energy source. Oxytetracycline makes the medium more selective by inhibiting the growth of *Lactobacilli* encountered in milk and milk products.

Quality Control

Appearance of powder	:	Yellow coloured homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.2 % Agar gel.
Colour and Clarity	:	Light amber coloured, clear to slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 3.71% w/v aqueous solution is pH 7.0±0.2 at 25°C.
Cultural Response	:	Cultural characteristics observed after an incubation at 25-30°C for 2 to 3 days with addition of (FD032) Oxytetra selective supplement

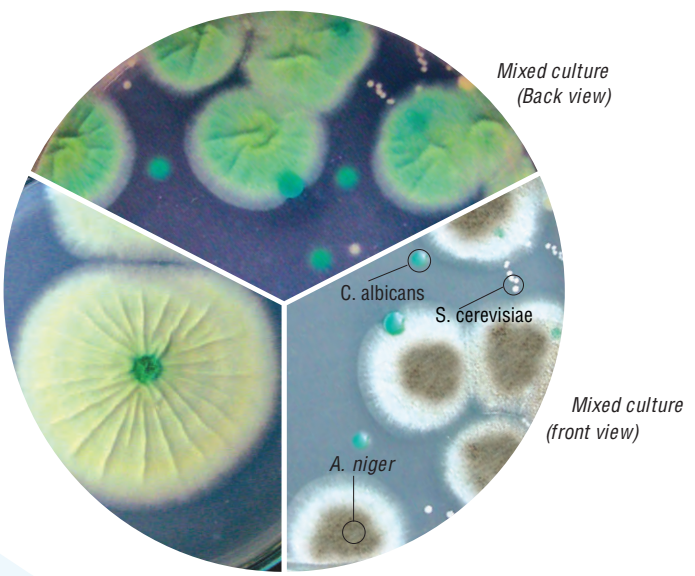
Organisms (ATCC)	Growth	Colour of Colony
A. niger (16404)	luxuriant	light blue with black spores
C. albicans (10231)	luxuriant	green
E. coli (25922)	inhibited	—
S. cerevisiae (19615)	luxuriant	colourless

References

1. Mossel D.A.A. Et al, 1970, J. Appl. Bact., 33:454.
2. Mossel D.A.A., Harrewijn G.A. and Elzebrock J.M., 1973, UNICEF.
3. Mossel D.A.A., Visser M. and Mengerink W.H.J., 1962, Lab. Prac. 11:109.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1467

HiCrome Ent. sakazakii Agar

Recommended for the isolation and identification of *Enterobacter sakazakii* from food, water, sewage, urine and faeces samples

M1577

HiCrome Ent. sakazakii Agar is recommended for the isolation and identification of *Enterobacter sakazakii* from food, water, sewage, urine and faeces samples

Composition**

Ingredients	Grams/Litre
Casein enzymic hydrolysate	15.00
Papaic digest of soyabean meal	5.00
Sodium chloride	5.00
Sodium deoxycholate	0.50
Sodium thiosulphate	1.00
Chromogenic mixture	10.17
Agar	15.00

Final pH (at 25°C) 7.3 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 51.67 grams in 1000 ml distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 45-50°C and pour into sterile petri plates.

Principle and Interpretation

Enterobacter species are widely distributed in nature occurring in fresh water, soil, sewage, plants, vegetables, animal and human faeces. *Ent. sakazakii* has been closely associated with neonatal meningitis and sepsis (1). The chromogenic substrate is cleaved specifically (2) by glucosidase possessed by *Enterobacter* species resulting in blue green colonies. Other organisms which do not cleave this substrate produces yellow coloured colonies.

Incorporation of the chromogenic mixture in the media renders an intense blue colour to *Ent. sakazakii* colonies where as light blue-green colour to other *Enterobacter* species.

Casein enzymic hydrolysate and papaic digest of soyabean meal provide the essential growth nutrients along with nitrogenous and carbonaceous compounds. Sodium chloride helps in maintaining the osmotic equilibrium of the medium. Sodium deoxycholate inhibits the accompanying gram positive flora.

Quality Control

Appearance of Powder	:	Pinkish beige coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.5% Agar gel.
Colour and Clarity	:	Purple coloured, clear to slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 5.16% w/v aqueous solution is pH 7.3 ± 0.2 at 25°C.
Cultural Response	**:**	Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

Organisms (ATCC)	Growth	Colour of Colony
E. coli (25922)	luxuriant	yellow
E. aerogenes (13048)	luxuriant	bluish green
E. faecalis (29212)	inhibited	-
E. sakazakii (12868)	luxuriant	blue
S. aureus (25923)	inhibited	-

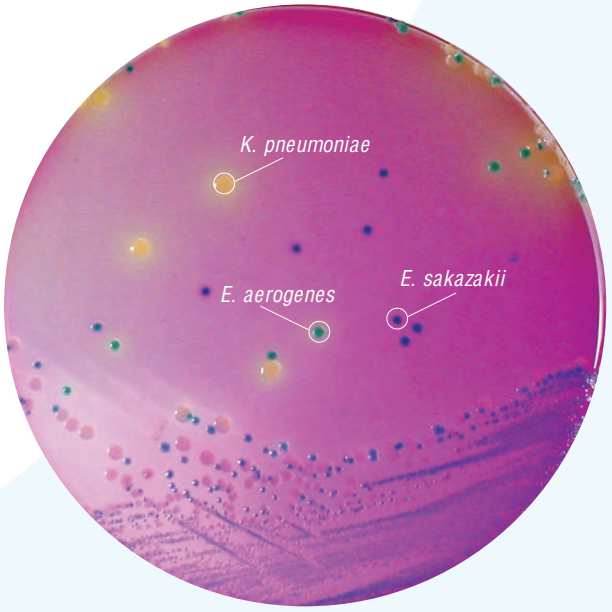
Reference

1. MUYTJENS HL, ZANEN HC, SONDERKAMP HJ-etal : Analysis of eight cases of neonatal meningitis and sepsis due to Enterobacter sakazakii, J. Clin Microbiol 18:115-120, 1983.

2. Isenberg (ed.), 1992. Clinical microbiology procedures handbook, vol. 1. American Society for Microbiology, Washington, DC.

Storage and Shelf-life

Store at 2 - 8°C in tightly capped container. Use before expiry date on the label.



M1577

HiCrome Ent. sakazakii Agar, Modified

HiCrome *Ent. sakazakii* Agar, Modified is recommended by ISO Committee for the isolation and identification of *Enterobacter sakazakii* from milk and milk products.

M1641

HiCrome *Ent. sakazakii* Agar, Modified is recommended by ISO Committee for the isolation and identification of *Enterobacter sakazakii* from milk and milk products.

Composition**

Ingredients	Grams/Litre
Casein enzymic hydrolysate	7.00
Yeast extract	3.00
Sodium chloride	5.00
Sodium deoxycholate	0.60
Chromogenic substrate	0.15
Crystal violet	0.02
Agar	15.00

Final pH (at 25°C) 7.0 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 30.75 grams in 1000 ml distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 45-50°C and pour into sterile petri plates.

Principle and Interpretation

Enterobacter species are widely distributed in nature occurring in fresh water, soil, sewage, plants, vegetables, milk and milk products, infant foods, animal and human feaces. *Ent. sakazakii* has been closely associated with neonatal meningitis and sepsis (1). This medium is recommended by ISO Committee for the isolation and identification of *Enterobacter sakazakii* (2). The chromogenic substrate is cleaved specifically (3) by *Enterobacter sakazakii* resulting in blue green colonies. Other organisms which do not cleave this substrate produces colourless to slightly violet coloured colonies.

Incorporation of the chromogenic mixture in the media renders an intense blue to blue green colour to *Ent. sakazakii* colonies where as other *Enterobacter* species give colourless or blue centered colonies.

Casein enzymic hydrolysate and Yeast extract provide the essential growth nutrients along with nitrogenous and carbonaceous compounds. Sodium chloride helps in maintaining the osmotic equilibrium of the medium. Sodium deoxycholate inhibits the accompanying gram positive flora.

Quality Control

Appearance of Powder	: Pinkish beige coloured, homogeneous, free flowing powder.
Gelling	: Firm, comparable with 1.5% Agar gel.
Colour and Clarity	: Purple coloured, clear to slightly opalescent gel forms in petri plates.
Reaction	: Reaction of 3.07% w/v aqueous solution is pH 7.0 ± 0.2 at 25°C.
Cultural Response	: Cultural characteristics observed after an incubation at 44 ±1°C for 18-24 hours.

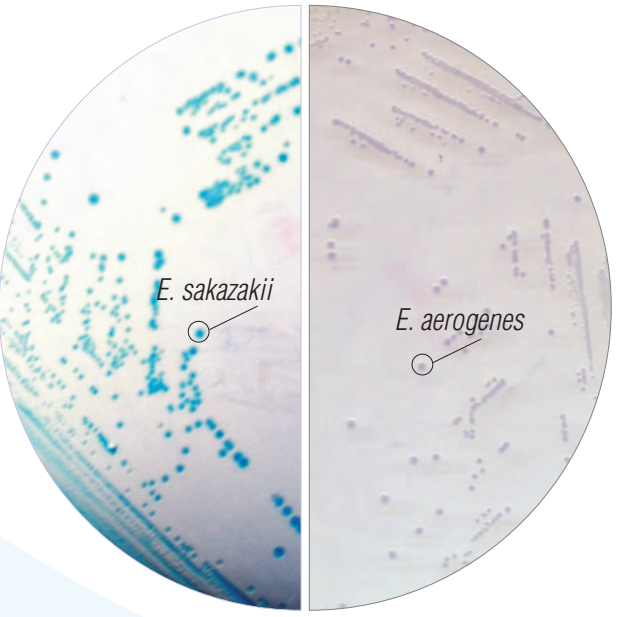
Organisms (ATCC)	Growth	Colour of Colony
E. coli (25922)	luxuriant	colourless
E. aerogenes (13048)	luxuriant	colourless with blue centre
E. faecalis (29212)	inhibited	-
E. sakazakii (12868)	luxuriant	blue-green
S. *aureus (25923)*	inhibited	-

References

1. MUYTJENS HL, ZANEN HC, SONDERKAMP HJ-etal : Analysis of eight cases of neonatal meningitis and sepsis due to Enterobacter sakazakii, J. Clin Microbiol 18:115-120, 1983.
2. International Organization for Standardization Draft ISO/ TS 22964, 2006 (E).
3. Isenberg (ed.), 1992. Clinical microbiology procedures handbook, vol. 1. American Society for Microbiology, Washington, DC.

Storage and Shelf-life

Store at 2 - 8°C in tightly capped container. Use before expiry date on the label.



M1641

HiCrome Kleb Selective Agar Base

M1573

For the isolation and detection of *Klebsiella* species from water and other sources.
This medium can also be used in membrane filtration procedure.

HiCrome Kleb Selective Agar Base is used for the isolation and detection of *Klebsiella species* from water and other sources. This medium can also be used in membrane filtration procedure.

Composition**

Ingredients	Grams/Litre
Peptone, special	12.0
Yeast extract	7.0
Sodium chloride	5.0
Bile salts mixture	1.5
SLS	0.1
Chromogenic mixture	0.2
Agar	15.0

Final pH (at 25°C) 7.1 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 20.4 grams in 500 ml distilled water. Heat to boiling to dissolve the medium completely. DO NOT AUTOCLAVE. Cool to 50°C and aseptically add rehydrated contents of one vial of Klebsiella Selective Supplement (FD225). Mix well and pour into sterile petriplates.

Principle and Interpretation

HiCrome Kleb Selective Agar Base is recommended for isolation and enumeration of *Klebsiella* species based on chromogenic differentiation. *Klebsiella pneumoniae* strains are distributed widely in the environment and contribute to biochemical and geochemical process (1). *Kleb. pneumoniae* causes severe often fatal pneumonia. It also proves to be the source of lung infections that generally occur in patients with debilitating conditions such as alcoholism, diabetes mellitus, and chronic obstructive pulmonary disease (2). The chromogenic substrate incorporated in the media is cleaved specifically by *Klebsiella* species to produce purple-magenta coloured colonies. *Klebsiella pneumoniae* the causative agent of pneumonia produces a purple-magenta coloured colony thereby aiding in the easy detection of the organisms. Most of the frequently encountered gram negative faceal contaminants are inhibited in this media using a selective supplement.

Peptone special and yeast extract provide the essential nutrients required for the growth of the organism. Sodium chloride maintains the osmotic equilibrium of the medium. Bile salts mixture and SLS inhibit most of the accompanying flora. Addition of the selective supplement further increases the selectivity of the medium.

Quality Control

Appearance of Powder	:	Light yellow coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.5% Agar gel.
Colour and Clarity	:	Light amber coloured, clear to slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 4.08% w/v aqueous solution is pH 7.1 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics observed after an incubation at 37°C for 24 hours with added Klebsiella Selective Supplement (FD225).

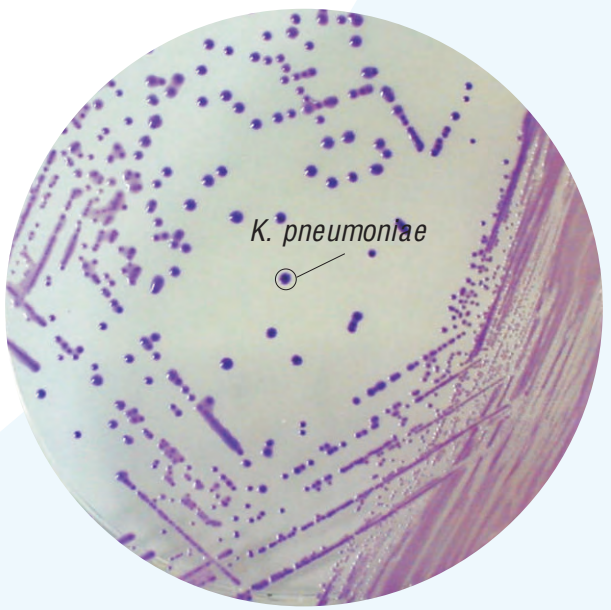
Organisms (ATCC)	Growth	Colour of Colony
E. aerogenes (13048)	-	-
E. coli (25922)	-	-
K. pneumoniae (13883)	luxuriant	purple-magenta (mucoid)
S. marcescens (8100)	-	-
S. serotype Typhi (6539)	-	-

Reference

1. Krieg, N.R., and J.G. Holt (ed.). 1984 Bergey's Manual of systematic Bacteriology, vol. 1, p. 408 516. The Williams and Wilkins Co., Baltimore, Md.
2. Reynolds HY: Pneumonia due to Klebsiella (Friedlander's pneumonia). In Wyngaarden JB, Smith LH (eds) : Cecil Text book of Medicine, 16th ed, pp 1430, 1432. Philadelphia, W B Saunders, 1982.

Storage and Shelf-life

Store at 2 - 8°C in tightly capped container. Use before expiry date on the label.



M1573

L. Mono Differential Agar Base

M1540

Differential Agar Base has been recommended by ISO Committee for the selective and differential isolation of *Listeria monocytogenes*

L. mono Differential Agar Base has been recommended by ISO Committee for the selective and differential isolation of *Listeria monocytogenes*.

Composition **

Ingredients	Grams/Litre
Meat peptone	18.00
Casein enzymic hydrolysate	6.00
Yeast extract	10.00
Sodium pyruvate	2.00
Glucose	2.00
Magnesium glycerophosphate	1.00
Magnesium sulphate	0.50
Sodium chloride	5.00
Lithium chloride	10.00
Disodium hydrogen phosphate anhydrous	2.50
Chromogenic substrate	0.05
Agar	15.00

Final pH (at 25°C) 7.2 ± 0.2
** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 36.0 grams in 460 ml distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 45-50°C. Aseptically add sterile contents of 1 vial of L. mono Enrichment Supplement I (FD214) sterile rehydrated contents of 1 vial each of L .mono Selective Supplement I (FD212) and L .mono Selective Supplement II (FD213). Mix well and pour into sterile petri plates.

Warning : Lithium chloride is harmful. Avoid bodily contact and inhalation of vapours. On contact with skin wash with plenty of water immediately.

Principle and Interpretation

L. mono Differential Agar Base is based on the formulation of Ottoviani and Agosti (2, 3) for the selective and differential isolation of *Listeria monocytogenes* from food and animal feeds which is adopted by ISO Committee (1).

Meat peptone, casein enzymic hydrolysate, yeast extract and sodium pyruvate provide essential growth nutrients and nitrogenous substances. Glucose is the fermentable carbohydrate. Sodium chloride maintains osmotic equilibrium. Phosphate buffers the medium. Lithium chloride and added selective supplements (FD212 and FD213) inhibit accompanying microflora and allow the growth of *Listeria* species. *Listeria* species hydrolyse the chromogenic substrate which produces greenish-blue coloured colonies. Differentiation of *Listeria monocytogenes* from other *Listeria* species is based on phosphatidylinositol-specific phospholipase C (PIPLC) activity. Phospholipase C enzyme hydrolyses the purified substrate (FD214) added to the medium resulting in an opaque halo around *Listeria monocytogenes* colonies.

Quality Control

Appearance of Powder	:	Light beige coloured, homogenous free flowing powder.
Gelling	:	Firm, comparable with 1.5% Agar gel.
Colour and Clarity	:	Light amber coloured, opalescent gel forms in petri plate.
Reaction	:	Reaction of 7.2% w/v aqueous solution is pH 7.2 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics observed after an incubation of 24 - 48 hours at 35-37°C.

Organisms (ATCC)	Growth	Colour of the Colony	PIPLC activity*
Listeria monocytogenes (19112)	luxuriant	greenish-blue	+
Listeria innocua (33090)	luxuriant	greenish-blue	-
Listeria ivanovii (19119)	luxuriant	greenish-blue	+
Listeria grayi	luxuriant	greenish-blue	-
Listeria seeligeri	luxuriant	greenish-blue	-
Listeria welshimeri	luxuriant	greenish-blue	-

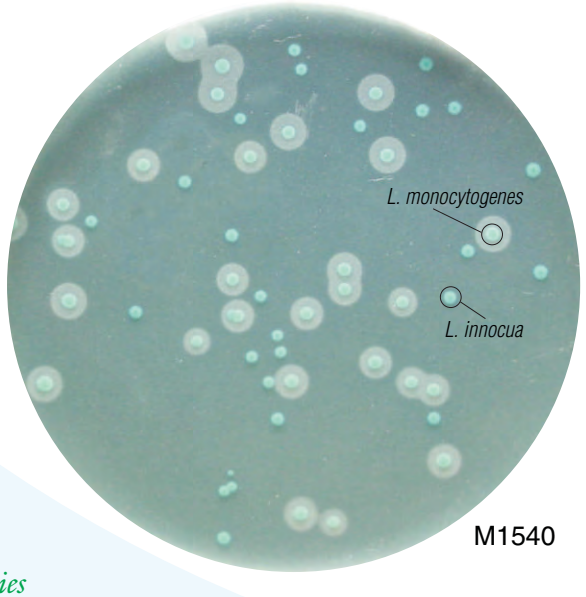
Key : PIPLC activity* = opaque halo around the colony exhibiting phosphatidylinositol - specific phospholipase C activity

References

1. Draft Amendment ISO 11290-2:1996/DAM 1.
2. Ottaviani F., Ottaviani M., and Agosti M. (1997 a), Industrie Alimentari 36, 1-3.
3. Ottaviani F., Ottaviani M., and Agosti M. (1997 b), Quimper Froid Symposium Proceedings p. 6, A.D.R.I.A. Quimper, France, 16-18 June 1997.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



M1540

HiCrome Listeria Agar Base, Modified

Selective and differential agar medium recommended for rapid and direct identification of *Listeria* species, specifically *Listeria monocytogenes*.

M1417

HiCrome Listeria Agar Base, Modified is a selective and differential agar medium recommended for rapid and direct identification of *Listeria* species, specifically *Listeria monocytogenes*.

Composition **

Ingredients	Grams/Litre
Peptone, special	23.00
Sodium chloride	5.00
Yeast extract	1.00
Meat extract	5.00
Lithium chloride	5.00
Rhamnose	10.00
Phenol red	0.12
Chromogenic mixture	5.13
Agar	13.00

Final pH (at 25°C) 7.3 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 33.62 grams in 500 ml distilled water. Boil gently to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 50°C. Add rehydrated contents of 1 vial of HiCrome Listeria Selective Supplement (FD181) aseptically. Mix well to resuspend and pour into sterile petri plates.

Warning : Lithium chloride is harmful. Avoid bodily contact and inhalation of vapours. On contact with skin wash with plenty of water immediately.

Principle and Interpretation

HiCrome Listeria Agar Base, Modified medium is a modification of a medium first developed by Notermans *et al.* (1) and Mengaud *et al.* (2) for the detection of *Listeria* species from food stuffs. HiCrome Listeria Agar Base, Modified allows growth of only *Listeria* species and gives a specific and direct identification of *L. monocytogenes* within 24-48 hours after pre-enrichment. This medium is based on both, the specific chromogenic detection and the rhamnose fermentation. The colonies of *L. ivanovii* appear blue without a yellow halo (Rhamnose -*ve*) while the colonies of *L. monocytogenes* and *L. innocua* are blue with a yellow halo (Rhamnose +*ve*).

Peptone, yeast extract and meat extract provide nitrogenous substances, vitamin B complex and other essential growth nutrients. Rhamnose is the fermentable carbohydrate with phenol red as an indicator. Sodium chloride maintains the osmotic equilibrium. The added Lithium chloride and HiCrome *Listeria* Selective Supplement (FD181) inhibit growth of most gram positive bacteria, gram negative bacteria, yeasts and moulds.

Quality Control

Appearance of powder	:	Light pink coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.3% Agar gel.
Colour and Clarity gel	:	Red coloured, clear to slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 6.72% w/v aqueous solution is pH 7.3 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics after 24-48 hours at 35 - 37°C (w/added FD181).

Organisms (ATCC)	Growth	Rhamnose fermentation	Colour of colony
L. monocytogenes (19118)	luxuriant	+ (yellow halo)	blue
L. ivanovii (19119)	luxuriant	—	blue
L. innocua (33090)	luxuriant	+ (yellow halo)	blue
E. coli (25922)	—	—	—
B. subtilis (6633)	—	—	—
P. aeruginosa (27853)	—	—	—
C. albicans (10231)	—	—	—

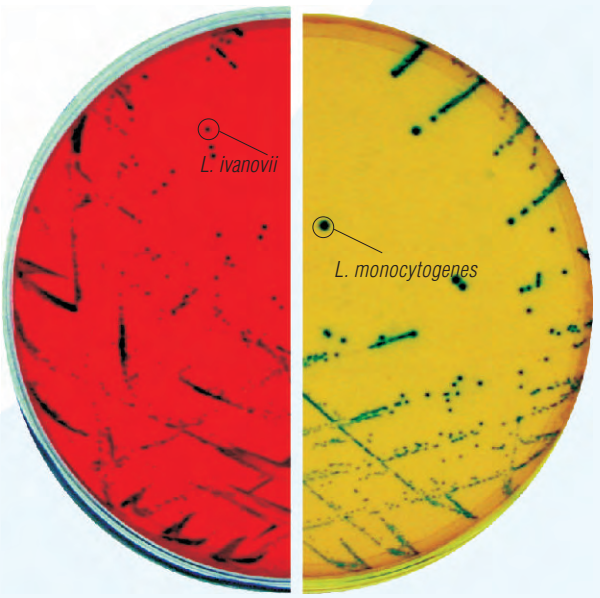
Key : + = positive reaction, - = negative reaction.

References

1. Notermans S.H. and Dufrenne J., (1991), Applied and Environmental Microbiology, 57(09):2666-70.
2. Mengaud J., Braun-Breton C. and Cossart P., (1991), Molecular Microbiology, 5(2): 367-372.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



HiCrome Aureus Agar Base

M1468

For isolation and identification of *Staphylococci* from environment samples.

HiCrome Aureus Agar Base is recommended for isolation and identification of *Staphylococci* from environment samples.

Composition **

Ingredients	Grams/Litre
Casein enzymic hydrolysate	12.0
Pancreatic digest of gelatin	3.0
Beef extract	6.0
Yeast extract	5.0
Sodium pyruvate	10.0
Lithium chloride	5.0
Chromogenic mixture	2.1
Agar	20.0

Final pH (at 25°C.) 7.0 ± 0.2

** Formula adjusted, standardized to suit performance parameters.

Directions

Suspend 63.1 grams in 950 ml distilled water. Boil to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 50°C and aseptically add 50 ml concentrated Egg Yolk Tellurite Emulsion (FD046). Mix well and pour into sterile petri plates.

Warning : Lithium chloride is harmful. Avoid bodily contact and inhalation of vapours. On contact with skin, wash with plenty of water immediately.

Principle and Interpretation

HiCrome Aureus Agar Base is recommended for the isolation and enumeration of coagulase positive *Staphylococcus aureus* from environment samples. Coagulase positive *S. aureus* gives brown black colonies with clear zone around the colony whereas *S. epidermidis* gives slightly brownish colonies. Other organisms give either colourless colonies or bluish coloured colonies due to the presence of chromogen. *Listeria monocytogenes* colonies are bluish in colour whereas *Bacillus*, *E.coli* and *Micrococcus* give colourless colonies.

Casein enzymic hydrolysate, pancreatic digest of gelatin, beef extract and yeast extract provide nitrogenous substances and other essential growth nutrients. Sodium pyruvate protects injured cells, helps recovery and enhances growth of *Staphylococcus*. Lithium chloride and potassium tellurite inhibit most of the contaminating microflora except *Staphylococcus aureus* (1). Due to the addition of egg yolk, proteolytic bacteria produce a clear zone around colony (1).

Quality Control

Appearance of powder	:	Yellow coloured homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 2.0 % Agar gel.
Colour and Clarity	:	Basal medium yields light amber coloured clear to slightly opalescent gel. With addition of Egg yolk Tellurite Emulsion (FD046) yellow coloured opaque gel forms in petri plates.
Reaction	:	Reaction of 6.31% w/v aqueous solution is pH 7.0 ± 0.2 at 25° C.
Cultural Response	:	Cultural characteristics observed after an incubation of 24-48 hours at 35 - 37°C.

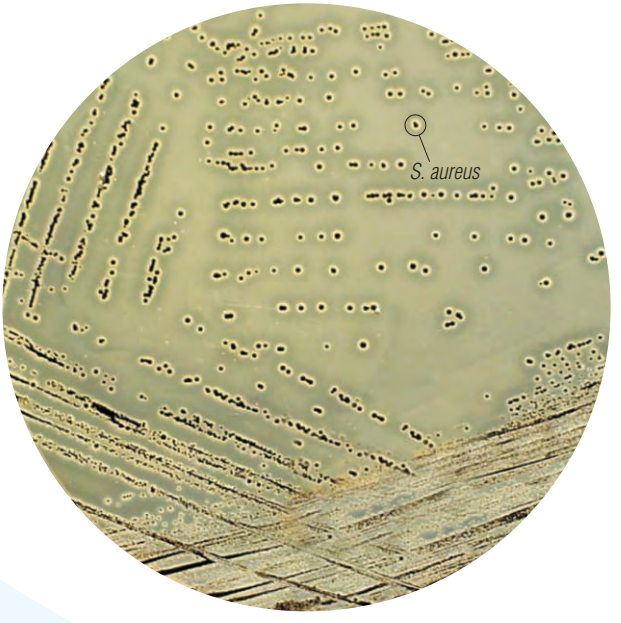
Organisms (ATCC)	Growth	Colour of Colony	Lecithinase
B. subtilis (6633)	none to poor	colourless	—
E. coli (25922)	none to poor	colourless	—
L. monocytogenes (19112)	fair-good	bluish	—
M. luteus (10240)	none to poor	colourless	—
S. aureus (25923)	good	brown-black	+
S. epidermidis (12228)	none to poor	yellow-slight brownish	—

References

1. Baird - Parker, Ac (1962) J Appl. Bact., 25:12.

Storage and Shelf-life

Store at 2-8°C on tightly capped container. Use before expiry date on the label.



M1468

M-CP Agar Base

M1354

For isolation and enumeration of *Clostridium perfringens* from water sample using membrane filtration technique.

M-CP Agar Base with selective supplement is recommended by the Directive of the Council of the European Union 98/83/EC for isolation and enumeration of *Clostridium perfringens* from water sample using membrane filtration technique.

Composition **

Ingredients	Grams/Litre
Tryptose	30.00
Yeast extract	20.00
Sucrose	5.00
L-Cysteine hydrochloride	1.00
Magnesium sulphate.7H_2O	0.10
Bromo cresol purple	0.04
Ferric chloride .6H_2O	0.09
Indoxyl- -D-glucoside	0.06
Agar	15.00

Final pH (at 25°C) 7.6 ± 0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 35.64 grams of dehydrated powder in 485 ml distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 50°C. Aseptically add the rehydrated contents of 1 vial of M-CP Selective Supplement (FD153) and 1 vial of M-CP Selective Supplement II (FD154). Mix well and pour into sterile petri plates.

Principle and Interpretation

M-CP Agar Base is prepared as per the formula of Armon and Payment (1). It is also recommended by the Directive of the Council of the European Union 98/83/EC (2) for isolation and enumeration of *Clostridium perfringens* from water samples using membrane filtration technique.

Tryptose, yeast extract provide nitrogenous compounds. Sucrose is the fermentable carbohydrate. Bromo cresol purple serves as a pH indicator. Indoxyl-ß-D-glucoside is a chromogenic substrate for ß-D-glucosidase or cellobiase and phenolphthalein diphosphate for the detection of acid phosphatase. The addition of D-Cycloserine and Polymyxin B makes the medium inhibitory to accompanying non-clostridial flora and thus allows analysis of both vegetative cells and spores of *Clostridium*. Further selectivity is provided by incubation under anaerobic conditions. Yellow (cellobiase-negative) colonies becoming old rose to pink-red upon exposure to ammonia fumes for 30 seconds are considered to be presumptive *Clostridium perfringens*. Colour differentiation on M-CP Agar Base is sometimes difficult, so typical colonies (yellow turning into pink) as well as atypical colonies (green or those that remained yellow upon exposure to ammonia fumes) are picked for confirmation. For further confirmation of *Clostridium perfringens* it is suggested to carry out following biochemical tests (3):

Sulphite reduction, gram-reaction, sporulating rods, motility, reduction of nitrate, gelatin liquefaction and lactose fermentation.

Quality Control

Appearance of powder	:	Light yellow coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.5% Agar gel.
Colour and Clarity	:	Purple coloured clear to slightly opalescent gel forms in petri plates.
Reaction	:	Reaction of 7.12% w/v aqueous solution is pH 7.6 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics after 24-48 hours at 44°C, under anaerobic conditions With added (FD153) and (FD154)

Organisms (ATCC)	Growth	Colour of colonies.
Cl. perfringens (12924)	good	Light yellow*
S. aureus (25923)	inhibited	—
B. subtilis (6633)	inhibited	—
S. serotype Typhi (6539)	inhibited	—

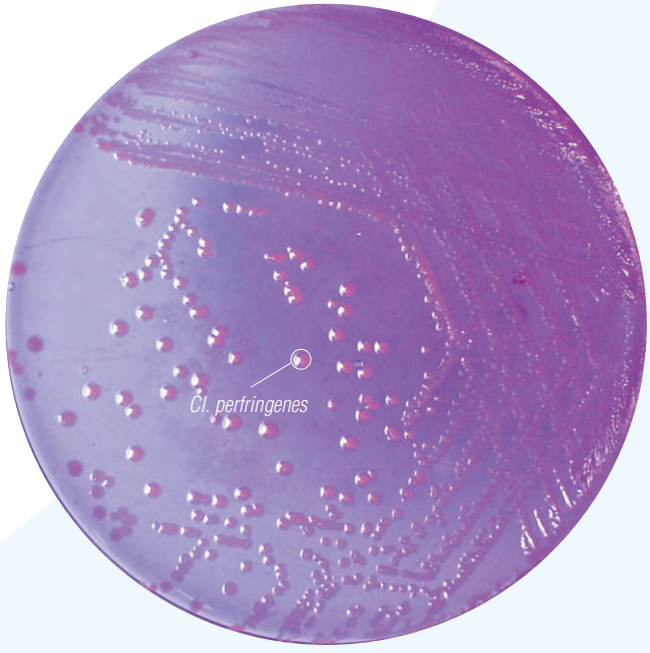
key : *= Yellow colonies become old rose after exposure to ammonia

References

1. Armon R. and Payment P., (1988), Can. J. Microbiol., 34:78-79.
2. Directive of the Council of the European Union 98/83/EC
3. D.P. Sartory, M. Field, S.M. Curbishley, and A.M. Pritchard, (1998), Left. Application Microbiol., 27:323-327.

Storage and Shelf-life

Store at 2- 8°C in tightly capped container. Use before expiry date on the label.



M1354

HiCrome Bacillus Agar

HiCrome Bacillus Agar is a differential medium recommended for rapid identification of Bacillus species from a mix culture by chromogenic method.

M1651

HiCrome Bacillus Agar is a differential medium recommended for rapid identification of Bacillus species froma mix culture by chromogenicmethod.

Composition**

Ingredients	Grams/Litre
Peptic digest of animal tissue	10.00
Meat extract	1.00
D-Mannitol	10.00
Sodium chloride	10.00
Chromogenic mixture	3.20
Phenol Red	0.025
Agar	15.00

Final pH (at 25°C) 7.1 ± 0.2

** Formula adjusted, standardized tosuit performance parameters

Directions

Suspend 49.2 grams in 1000ml distilled water. Heat to boiling to dissolve the medium completely. DONOT AUTOCLAVE. Cool to 50°C aseptically add 1 vial of Polymyxin B Selective Supplement (FD003) if desired. Mix well and pour into sterile petri plates.

Principle and Interpretation

Hicrome Bacillus Agar is based on the formulation of MYP Agar formulated by Mossel et al (1) used for enumeration of *Bacillus cereus* and *Bacillus thuringiensis* when present in large number in certain food stuffs. *B. cereus* causes food poisoning due toconsumption of contaminated rice (1,2,3)eye infections and a wide range of other clinical conditions like abscess formation, meningitis, septicaemia and wound infection.

The medium contains peptic digest of animal tissues and meat extract which provide nitrogenous compounds. Mannitol serves as the fermentable carbohydrate, fermentation of which can be detected by phenol red. Mannitol fermenting organisms like *B. megateruim* yield yellow coloured colonies. The chromogenic mixture present in the medium is cleaved by the enzyme ß-glucosidase found in *B. cereus* resulting in the formation of blue colonies. *B. thuringiensis* will also grow as blue/green colonies on this medium as *B. cereus* and *B. thuringiensis* are biochemically identical. If selective isolation of *B. cereus* or *B. thuringiensis* is required aseptically add polymyx in- B.

Quality Control

Appearance of Powder : Light pink coloured, homogeneous, free flowing powder.
Gelling : Firm, comparable with 1.5% Agar gel.
Colour and Clarity : Red coloured, clear to slightly opalescent gel forms in petri plates.
Reaction : Reaction of 4.92% w/v aqueous solution is pH 7.1 ± 0.2 at 25°C.
Cultural Response : Cultural characteristics observed after an incubation of 24-48 hours at 30°C.

Organisms (ATCC)	Growth**	Growth*	Colour of colony
Bacillius subtilis (6633)	none	poor-good	light green to green colonies
Bacillius cereus (10876)	luxuriant	luxuriant	light blue, large, flat colonies with blue centre
Bacillius thuringiensis (10792)	luxuriant	luxuriant	light blue, large, flat colonies with irregular margins
Bacillius megaterium (14581)	none	luxuriant	yellow, mucoid colonies
Bacillius coagulans (7050)	none	luxuriant	pink, small, raised colonies
Staph. aureus (25923)	inhibited	luxuriant	yellow colonies
Enterococcus faecalis (29212)	inhibited	luxuriant	yellow colonies

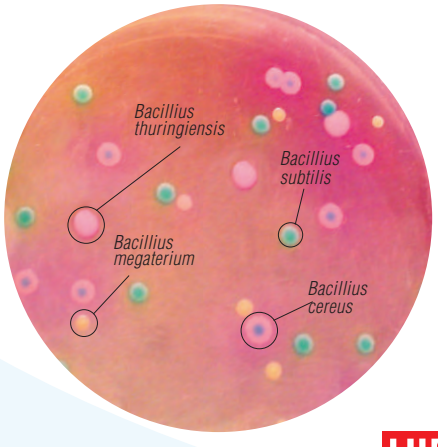
Key : Growth ** : Growth with addition of FD003
* : Growth without addition of FD003

References

1. Mortimer P.R. and McCann G., 1974, Lancet, 1043.
2. Bouza E., Grant S., Jordan C., et al, 1979, Arch. Ophthamol., 97:488.
3. Wohlgemuth K., Kirkbride, C.A., Bicknell, E.J. and Ellis, R.P., 1972 Am. Vet. Met, Ass., 161:1691

Storage and Shelf-life

Store at 2-8°C in tightly capped containers. Use before expiry date on the label.



M1651

HiCrome™ Fluorogenic Media

HiFluoro Pseudomonas Agar Base

M1469

For selective isolation of *Pseudomonas aeruginosa* from clinical and nonclinical specimens by fluorogenic method.

HiFluoro Pseudomonas Agar Base is recommended for selective isolation of *Pseudomonas aeruginosa* from clinical and nonclinical specimens by fluorogenic method.

Composition **

Ingredients	Grams/Litre
Pancreatic digest of gelatin	18.00
Magnesium chloride	1.40
Potassium sulphate	10.00
Cetrimide	0.30
Fluorogenic mixture	2.05
Agar	15.00

Final pH (at 25°C) 7.2 ± 0.2

* Formula adjusted, standardized to suit performance parameters.

Directions

Suspend 46.75 grams in 1000 ml distilled water containing 10 ml glycerol. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Mixwell and pour into sterilepetri plates.

Principle and Interpretation

HiFluoro Pseudomonas Agar Base is a formulation based on the formula described by King *et al.* (1) except Fluorogenic mixture. It is used as the selective medium for the isolation of *Pseudomonas aeruginosa* from pus, sputum and drains etc. Cetrimide (Cetyltrimethylammonium bromide) is incorporated into the medium to inhibit bacteria other than *Pseudomonas aeruginosa.* It acts as a quaternary ammonium compound, cationic detergent, which causes nitrogen and phosphorus to be released from bacterial cells other than *Pseudomonas aeruginosa. Pseudomonas aeruginosa* breaks the fluorogenic compound to release the fluorogen, which produces a visible fluorescence under long wave UV light.

Quality Control

Appearance of powder	:	Light yellow coloured homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.5 % Agar gel.
Colour and Clarity	:	Light amber coloured, opalescent gel, with slight precipitation may occur in petriplates.
Reaction	:	Reaction of 4.67 % w/v aqueous solution is pH 7.2 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics observed after an incubation of 24-48 hours at 35-37°C.

Organisms (ATCC)	Growth	Fluorescence (Under uv light)
E. coli (25922)	inhibited	-
P. aeruginosa (27853)	good	+
P. maltophila (13637)	inhibited	-
S. aureus (25923)	inhibited	-

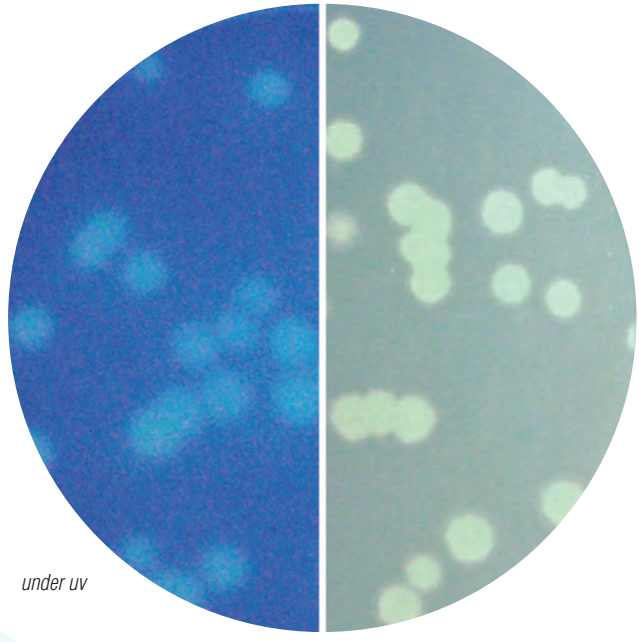
Key : + = positive reaction, – = negative reaction.

References

1.King, Ward and Raney, 1954. J. Lab. Clin. Med., 44:301.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.



P. aeruginosa

M1469

Rapid HiColiform Agar / Broth

For detection and confirmation of *Escherichia coli* and total coliforms from water samples, using a combination of chromogenic and fluorogenic substrates.

M1465 / M1453

Rapid HiColiform Agar / Broth are used for detection and confirmation of *Escherichia coli* and total coliforms from water samples, using a combination of chromogenic and fluorogenic substrates.

Composition **	M1465	M1453
Ingredients	**Grams/Litre**	**Grams/Litre**
Peptone, special	5.00	5.00
Sodium chloride	5.00	5.00
Sorbitol	1.00	1.00
Dipotassium hydrogen phosphate	2.70	2.70
Potassium dihydrogen phosphate	2.00	2.00
Sodium lauryl sulphate	0.10	0.10
Chromogenic substrate	0.08	0.08
Fluorogenic substrate	0.05	0.05
IPTG	0.10	0.10
Agar	15.00	—

Final pH (at 25°C) 6.8±0.2

** Formula adjusted, standardized to suit performance parameters

Directions

Suspend 16.0 grams of M1453 (single strength) and 31.0 grams of M1465 in 1000 ml distilled water. For double strength broth use 32.0 grams of M1453 in 1000 ml distilled water. Heat if necessary to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes.

Principle and Interpretation

The Rapid HiColiform Agar / broth are modification of LMX Broth described by Manafi and Kneifel (2). The Rapid HiColiform Agar / broth are used for the simultaneous detection of total coliforms and *Escherichia coli.*

The fluorogenic substrate is split by enzyme -glucuronidase specifically found in *Escherichia coli.* The reaction is indicated by the development of a blue fluorescence under UV light. The presence of total coliforms is indicated by a blue-green colourations due to the cleavage of the chromogenic substrate. IPTG amplifies enzyme synthesis and increases the activity of -galactosidase. To confirm presence of *E. coli* in broth medium by indole reaction overlay the medium with Kovac's reagent. The layer turns red within 2 minutes in case of positive reaction. For Agar medium, add 2-3 drops of Kovac's reagent over the suspected colony. The colony turns red within 2 minutes if the reaction is positive.

Special peptone, (rich in tryptophan content), provides essential growth nutrients and is useful for the simultaneous detection of indole production. Sorbitol provides the carbon source. The phosphate salts provide buffering action for rapid growth of coliforms. Sodium lauryl sulphate makes the medium selective by inhibiting accompanying microflora, especially the gram-positive organisms.

Quality Control

Appearance of powder : Light yellow coloured, homogeneous, free flowing powder.

Gelling : Firm, comparable with 1.5% Agar gel.

Colour and Clarity : Light yellow coloured, clear solution forms in tubes / petri plates.

Reaction : Reaction of 1.6% w/v of M1453 or 3.1% w/v of M1465 aqueous solution is pH 6.8 ± 0.2 at 25°C.

Cultural Response : Cultural characteristics after 18-24 hours at 35 - 37°C.

Organisms (ATCC)	Colour change in medium	Fluorescence*	Indole reaction
E. aerogenes (13048)	blue-green	—	—
E. coli (25922)	blue-green	+	+

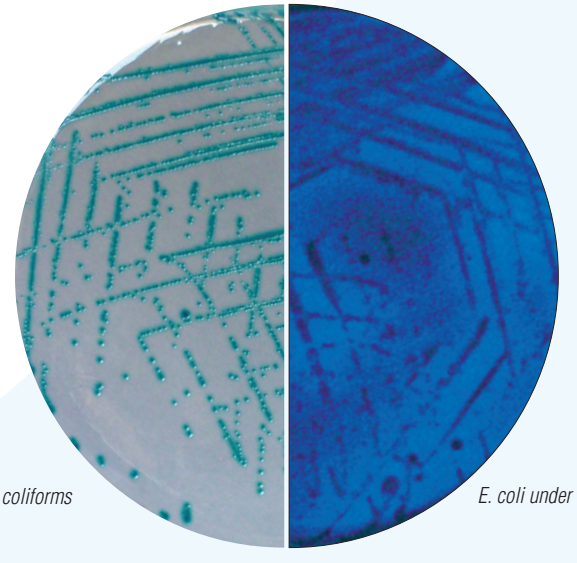
Key : + = positive reaction, - = negative reaction.
* Fluorescence as under UV light.

References

1. Hahn G. and Wittrock E., (1991), Acta Microbiologica Hungarica 38(3-4):265-271.
2. Manafi. M. and Kneifel W., (1989), Zbl. Hygiene and Umweltmedizin 189:225-234.
3. Manafi M., (1990), Forum Stadte-Hygiene 41:181-184.
4. Manafi M., (1991), Ernahrung / Nutrition, 15, Nr. 10.
5. Manafi M. and Kneifel W., (1991), Acta Microbiologica Hungarica 33(3-4):293-304.
6. Manafi M., Kneifel B. and Bascon S., (1991), Microbiol. Rev., 55:335-348.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the



Other coliforms *E. coli under uv*

M1465

HiCrome ECD Agar w/ MUG

M1488

For the detection of *Escherichia coli* in water and food samples by using a combination of chromogenic and fluorogenic substrate.

For the detection of *Escherichia coli* in water and food samples by using a combination of chromogenic and fluorogenic substrate.

Composition **

Ingredients	Grams/Litre
Casein enzymic hydrolysate	20.00
Bile salts mixture	1.50
L-Tryptophan	1.00
Lactose	5.00
Sodium chloride	5.00
Dipotassium hydrogen phosphate	4.00
Potassium dihydrogen phosphate	1.50
Fluorogenic substrate	0.07
Chromogenic substrate	0.10
Agar	15.00

Final pH (at 25°C) 7.0 ± 0.2

** Formula adjusted, standardized to suit performance parameters.

Directions

Suspend 53.17 grams in 1000ml distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes.

Principle and Interpretation

HiCrome ECD Agar w/ MUG is recommended for rapid detection of *Escherichia coli* by using a combination of chromogenic and fluorogenic substrates. The presence of *Escherichia coli* is indicated by blue coloured colony formation due to cleavage of chromogenic substrate. Fluorogenic substrate permits rapid detection of *Escherichia coli* when medium is observed for fluorescence using UV light (1,2). Fluorogenic substrate also detects anaerogenic strains which may not be detected in conventional procedure (1). It is hydrolysed by enzyme ß-D-Glucuronidase, possessed by *Escherichia coli* to yield a fluorescent end product. The reaction is indicated by a blue fluorescence under UV light.

Casein enzymic hydrolysate provides essential nutrients. Lactose is the fermentable carbohydrate. Sodium chloride maintains osmotic equilibrium. The medium has a strong buffering system to control the pH in presence of fermentative action. The bile salt mixture inhibits gram-positive bacteria especially *Bacillus* species and faecal *Streptococci*.

Quality Control

Appearance of Powder	:	Light yellow coloured, homogeneous, free flowing powder.
Gelling	:	Firm, comparable with 1.5% Agar gel.
Colour and Clarity	:	Light amber coloured, clear gel forms in petri plates.
Reaction	:	Reaction of 5.32% w/v aqueous solution is pH 7.0 ± 0.2 at 25°C.
Cultural Response	:	Cultural characteristics observed after an incubation of 18-24 hours at 44°C.

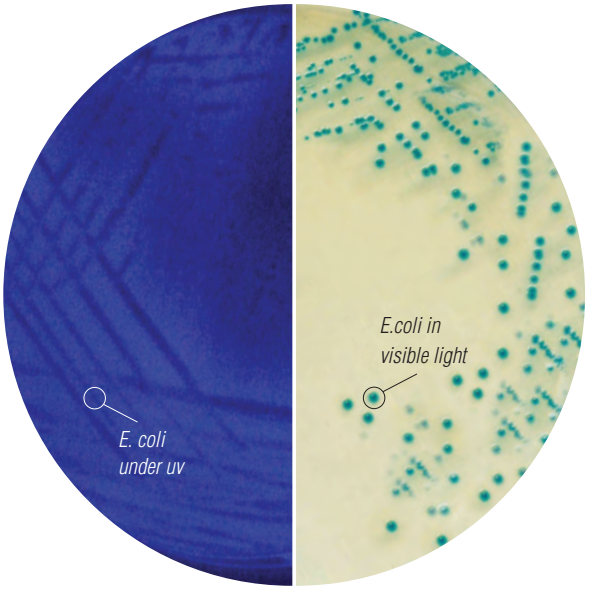
Organisms (ATCC)	Growth	Cololur of Colony	Fluorescence under UV	Indole
E. coli (25922)	good	blueish-green	+	+
K. pneumoniae (13883)	good	colourless	—	—
P. aeruginosa (27853)	good	colourless	—	—
S. faecalis (29212)	inhibited	—	—	—

References

1. Feng, PCS and Hartman, PAS, (1982), Appl. Environ. Microbiol. 43:132.
2. Robinson (1984), Appl. Environ. Microbiol., 48:285.

Storage and Shelf-life

Store at 2-8°C in tightly capped container. Use before expiry date on the label.

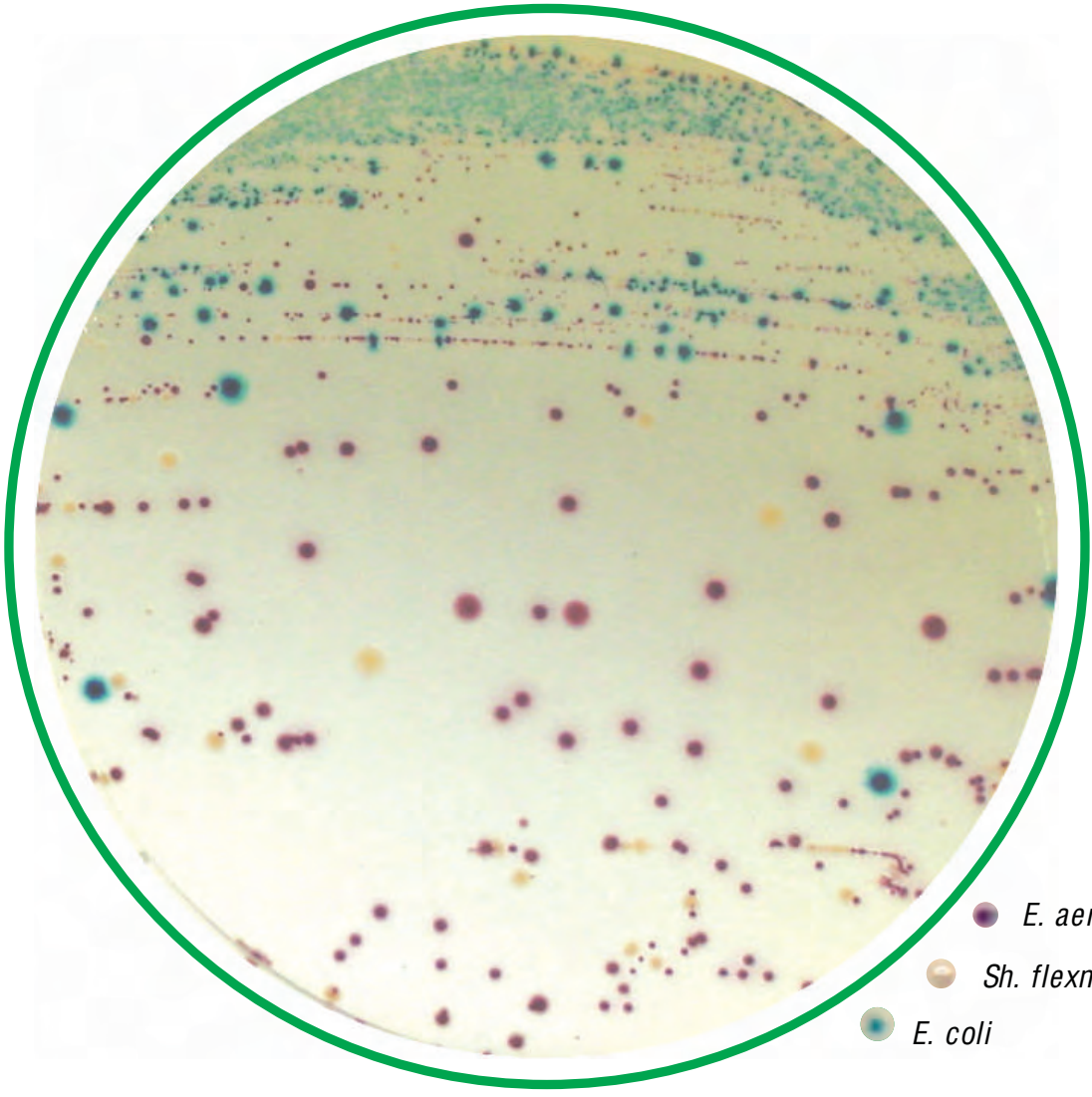


M1488

HiCromeVeg™

Single Streak Rapid Differentiation Series

Freedom from BSE / TSE worries



MV1294

HiCromeVeg™ Single Streak Rapid Differentiation Series are Chromogenic Media where animal based nutrients have been substituted with Vegetable based nutrients.

HIMEDIA®

HiCrome™

Single Streak Rapid Differentiation Series

HiMedia Laboratories™

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For life is precious

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