



Instruction for Use Microgen GN A + B ID System

Cat. No.: MID64; MID65



MICROGEN GN A+B ID

Quick Reference

	GN A	GN A+B	GN A+B
OXIDASE	NEGATIVE	NEGATIVE	POSITIVE
INOCULUM	1 colony in 3ml saline	1 colony in 5ml saline	1 colony in 5ml saline Add 1 drop sterile horse serum /ml saline if Actinobacillus or Pasteurella spp. suspected.
INOCULATION	3-4 drops (100µl) per well	3-4 drops (100µl) per well	3-4 drops (100µl) per well
OVERLAY WITH OIL	Well 1 – Lysine Well 2 – Ornithine Well 3 – H ₂ S Well 9 - Urease	Wells 1, 2, 3 and 9 plus Well 20 – Arabinose Well 24 – Arginine	Wells 1, 2, 3 and 9 plus Well 24 – Arginine
INCUBATION TIME	18 - 24 hours	18 - 24 hours	48 hours
TEMPERATURE	35 - 37°C	35 - 37°C	35 - 37°C (25°C for <i>Ps. fluorescens</i>)
INITIAL READINGS	Well 8: Indole - Add 2 drops Kovac's reagent. Read after 60 seconds	As for GN A	As for GN A Well 7 – record ONPG result. Add 1 drop Nitrate A+1 drop Nitrate B – read after 60 seconds Gelatin – interpret at 48 hours
ADDITION OF REAGENTS	Well 10: VP – Add 1 drop VPI reagent and 1 drop VPII reagent. Read after 15-30mins Well 12: TDA – Add 1 drop of TDA reagent and read after 60 seconds	Gelatin: Interpret at 24 hours Well 24: Arginine - Yellow = Negative Green/Blue = Positive	Well 24: Arginine - Yellow = Negative Blue = Positive
FINAL READING (Optional Microgen Software)			

Note: A black circle around the top of a well indicates a well requiring the addition of mineral oil prior to incubation. A broken black circle around a well requires the addition of mineral oil prior to incubation only if the isolate is oxidase negative. A green circle around the top of a well indicates a well requiring addition of reagents after incubation.



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1 INTRODUCTION

The Microgen GN-ID system employs 12 (GN A) or 24 (GN A+B) standardised biochemical substrates in microwells to identify the family *Enterobacteriaceae* and other non-fastidious Gram-negative bacilli (oxidase negative and positive). The kit is intended for professional laboratory use only.

2 PRINCIPLE

The Microgen GN-ID system comprises two separate microwell test strips GN A and GN B. Each Microwell test strip contains 12 standardised biochemical substrates which have been selected on the basis of extensive computer analysis (1) of published databases for the identification of the family *Enterobacteriaceae* and commonly encountered non-fastidious oxidase positive and negative Gram-negative bacilli (2; 3; 4). The dehydrated substrates in each well are reconstituted with a saline suspension of the organism to be identified. If the individual substrates are metabolised by the organism, a colour change occurs during incubation or after addition of specific reagents (see SUBSTRATE REFERENCE TABLE). The permutation of metabolised substrates can be interpreted using the Microgen Identification System Software (MID60) to identify the test organism.

The GN A microwell test strip is intended for the identification of oxidase negative, nitrate positive glucose fermenters comprising the most commonly occurring genera of the family *Enterobacteriaceae*. The GN A and GN B microwell test strips are used together to produce a 24 substrate system to identify non-fastidious Gram-negative bacilli (oxidase negative and positive) in addition to all currently recognised species of the family *Enterobacteriaceae* (28 genera) - see data tables.

THE GN B MICROWELL TEST STRIP IS DESIGNED TO BE USED IN CONJUNCTION WITH THE GN A STRIP AND NOT ON ITS OWN.

3 REAGENTS

GN-ID A Panel Contents (60 tests)

- 60 GN-A ID microwell test strips (microwell test strips containing 12 biochemical substrates)
- Result forms
- Holding frame microwell test strip

GN-ID B Panel Contents (24 tests)

- 24 GN-B ID microwell test strips (microwell test strips containing 12 biochemical substrates to be used with GN A microwell test strip for identification of GN B organisms).

Additional Materials Required (**not supplied in the kit**)

To ensure the correct colour response items b-g should be purchased from Gold Standard Diagnostics, see catalogue numbers (MID61X) specified below:

- a. Microgen Identification System Software (MID60)
- b. Oxidase Strips (5), recommended MID61G
- c. Mineral Oil, recommended MID61H
- d. VP I and VP II Reagents (6), recommended MID61C and MID61D
- e. Nitrate A and B Reagents, only in combination with MID65 (7), recommended MID61A and MID61B
- f. TDA Reagent (8), recommended MID61E
- g. Kovacs's Reagent (9), recommended MID61F
- h. Colour chart for reading results (included in IFU)
- i. Sterile 0.85% saline
- j. Sterile pipettes and bacteriological loops
- k. Incubator, not fan-assisted (35-37°C)
- l. Motility medium

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- m. Sterile horse serum (if *Actinobacillus spp.* or *Pasteurella spp.* are suspected)
- n. Bunsen burner

4 WARNINGS AND PRECAUTIONS

4.1 SAFETY

1. This procedure uses / detects pathogenic microorganisms and / or their metabolic products. Care should be taken to avoid ingestion or inhalation of potentially infectious aerosols or contact with the skin. Laboratory personnel should follow appropriate laboratory safety precautions and have ready access to associated material safety data sheets (SDS, please refer to Gold Standard Diagnostics repository: <https://www.goldstandarddiagnostics.com/document-repository>). While handling pathogens, personnel should use appropriate biosafety containment (<https://www.cdc.gov/labs/BMBL.html>) and be provided with appropriate personal protective equipment including clothing, protective gloves and appropriate eye protection.
2. The Microgen GN A ID system is intended for use by qualified laboratory personnel (professional use only) and this kit is not intended for Clinical/ Medical purposes.
3. Take appropriate precautions when handling or disposing of potential pathogens.
4. After use, dispose of all contaminated materials by autoclaving, incineration, or immersion in an appropriate disinfectant, e.g., sodium hypochlorite at a final concentration of 3% for 30 minutes. Liquid waste containing acid must be neutralized before treatment.
5. Dispose of according to local, national, or regional regulations. The waste generated should be disposed of following the Company's infectious/pathogenic material disposal procedure.

4.2 PROCEDURAL

1. The Microgen GN-ID system should be used according to the kit instructions.
2. The microwell test strips **must not** be incubated in a CO₂ incubator.
3. Due to their more demanding nutritional requirements, *Actinobacillus spp.* and *Pasteurella spp.* will require the addition of some form of enrichment to the inoculum. The addition of 1 drop of sterile inactivated horse serum per mL of sterile saline when preparing the inoculum is recommended.
4. If *Pseudomonas fluorescens* is suspected, the microwell test strips A & B should be incubated at 25°C.
5. Incorrect incubation, inadequate filling of wells, or inadequate inoculum density may give false results.

5 STORAGE AND SHELF LIFE

The Microgen GN-A ID and Microgen GN-B ID microwell test strips are stable in unopened foil pouches at 2-8°C until the expiry date on the label. Do not freeze. Opened and partially used pouches of microwell test strips can be stored for up to 14 days at 2-8°C provided that the pouch is resealed and contains the desiccant sachets.

6 PROCEDURE

6.1 SPECIMENS

A pure 18–24-hour culture of the bacterial isolate to be identified must always be used. An oxidase test must be carried out on the isolate prior to microwell test strip inoculation.

6.2 INOCULATION AND INCUBATIONS

1. Carry out an oxidase test on the isolate. Oxidase positive organisms can only be identified by inoculating both GN A and GN B microwell test strips.
2. Emulsify a single colony from an 18-24 hours culture in 3mL sterile 0.85% saline for the GN A microwell test strip. If both GN A and GN B microwell test strips are to be inoculated, the colony should be emulsified in 3-5mL sterile 0.85% saline. Mix thoroughly.
3. Carefully peel back the adhesive tape sealing the microwell test strip (s). **Do NOT discard the sealing strip(s) as they will be required later.**
4. Using a sterile pasteur pipette, add 3-4 drops (approximately 100µL) of the bacterial suspension to each well of the microwell test strip(s).
5. As a purity check, transfer 1 drop of the bacterial suspension on to a purity plate using a non-selective differential medium. Incubate the plate aerobically at 35-37°C for 18-24 hours.
6. After inoculation, overlay wells 1,2,3 and 9 (GN A microwell test strip counting from the tabbed end) and wells 20 and 24 (GN B microwell test strip - well 13 is at the tabbed end) with 3-4 drops of mineral oil. **(Do NOT overlay well 20 if isolate is oxidase positive).**
7. These wells are highlighted with a black circle (broken black circle in the case of well 20) around the well to assist in decision making in respect of oil overlays.
8. Seal the top of the microwell test strip (s) with the adhesive tape removed earlier and incubate at 35-37°C. **Ensure that the punctures in the adhesive tape are over wells 7, 11 and 12 in the GN A strip and over well 14 in the GN B strip.**
9. The GN A and GN B microwell test strips are read after 18-24 hours of incubation for *Enterobacteriaceae*, and after 48 hours for oxidase positive isolates.

6.3 READING AND ADDITION OF REAGENTS

6.3.1 GN A STRIP

1. Remove the adhesive tape and record all positive reactions with the aid of the colour chart (included in this booklet). Record the results on the forms provided.
2. Add the appropriate reagents to the following microwells:
 - a) Add 2 drops of Kovacs's reagent to well 8. Read and record the results after 60 seconds. Formation of a red colour indicates a positive result.
 - b) Add 1 drop of VP I reagent and 1 drop of VP II reagent to well 10 and read after 15-30 minutes. Formation of a deep pink/red colour indicates a positive result.
 - c) Add 1 drop of TDA reagent to well 12 and read after 60 seconds. Formation of a cherry red/dark brown colour indicates a positive result.
3. For oxidase positive organisms, perform the nitrate reduction test on well 7 after reading and recording the ONPG result.
 - a) Add 1 drop of Nitrate A reagent and 1 drop of Nitrate B reagent to the well and read after 60 seconds. The development of a red colour indicates that nitrate has been reduced to nitrite. If well 7 remains yellow or colourless after addition of nitrate reagents, add a small amount of zinc powder. This will indicate whether nitrate has been completely reduced to nitrogen gas.
 - i.e. After addition of Nitrate A + B:
 - Red = Positive
 - Colourless/Yellow = Negative
 - After addition of zinc powder:
 - Colourless/Yellow = Positive
 - Red = Negative.
4. Record these additional results on the forms provided.

6.3.2 GN B STRIP

1. Remove the adhesive tape and record all positive reactions with the aid of the colour chart. Record the results on the forms provided.
2. Read specific well as follows:
 - a. the gelatine well (no.13) must be read after 18-24 hours for *Enterobacteriaceae* and after 48 hours for oxidase positive isolates. A positive gelatine liquefaction result is indicated by black particles visible throughout the well.
 - b. The arginine well is interpreted differently after 24 hours and 48 hours incubations:
 - 24 hours (*Enterobacteriaceae*)
 - Yellow = Negative
 - Green/Blue = Positive
 - 48 hours (Oxidase positive organisms)
 - Yellow/Green = Negative
 - Blue = Positive

7 IDENTIFICATION

On the Microgen GN-ID A+B Report Form, the substrates have been organised into triplets (sets of 3 reactions) with each substrate assigned a numerical value (1, 2 or 4). The sum of the positive reactions for each triplet forms a single digit of the Octal Code that is used to determine the identity of the isolate. The Octal Code is entered into the Microgen Identification System Software (MID60), which generates a report of the five most likely organisms in the selected database.

The software provides an identification based on probability, % probability and likelihood with an analysis of the quality of differentiation. Full definition of these terms and an explanation of their usefulness in interpretation is provided with the software Help manual.

Note: For oxidase positive organisms (miscellaneous Gram-negative bacilli):

- Record weak reactions as negative
- The results for oxidase, nitrate reduction and motility must be included to form a 9 digit Octal Code

8 REPORT FORM



Microgen GN-ID A&B Panel
REPORT FORM

Lab. No.	Specimen Type:
	Date:

Reaction	GN A wells										GN B wells													
	Lysine	Ornithine	H2S	Glucose	Mannitol	Xylose	ONPG	Indole	Urease	VP	Citrate	TDA	Gelatine	Malonate	Inositol	Sorbitol	Rhamnose	Sucrose	Lactose	Arabinose	Adonitol	Raffinose	Salicin	Arginine
Result																								
Reaction Index	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1	4	2	1
Sum of Positive Reactions																								

Octal Code: _____ Final Identification: _____

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Oxidase, motility and nitrate tests only need to be performed once and recorded once (for GN-ID A) because it can mis-interpreted to perform and record in both GNA and B. This would mean having a 9 or 10-digit octal code instead of a 8 or 9-digits octal code for GNA+B.

Important:

The Microgen GN-ID A microwell test strip will generate a 4 digits Octal Code.

The Microgen GN-ID A+B microwell test strips will generate an 8 digits Octal Code.

The Microgen GN-ID A+B microwell test strips will generate a 9 digits Octal Code for oxidase positive isolates.

9 LIMITATIONS OF USE

1. Results should be interpreted in the context of all available laboratory information.
2. The Microgen ID system is intended for identification of those organisms included in the database. It should not be used to identify any other bacteria.
3. Test only pure, single colonies since mixed colonies may give erroneous results.
4. Reactions obtained using Microgen GN-ID may differ from published data obtained using alternative substrate formulations or reagents.
5. Some bacterial strains may have atypical biochemical reactions and may be difficult to identify.
6. Computer generated identification results should be interpreted by suitably trained personnel.
7. When determining the final identification of an isolate, the source of the isolate, Gram staining, colonial morphology, additional tests and tests against the suggested identification should be considered.
8. Motility and nitrate tests must be performed on oxidase positive, Gram-negative bacilli. A 9 digit Octal Code is required to interpret the results using the Microgen Identification System Software.
9. The GN-ID A microwell test strip may not be able to differentiate accurately between *Klebsiella spp*, *Enterobacter spp* and *Serratia spp*. Species within these three genera may be differentiated by using GN-ID A+B. Alternatively, additional tests such as motility and DNase tests can be used.
10. The confirmation of *Salmonella spp*. and the full identification requires the performance of serotyping. Whenever the Microgen Identification Software suggests an identification of *Salmonella*, the following additional comment will be displayed: 'Salmonella cannot be fully identified using biochemistry alone. Perform Polyvalent 'O' and 'H' slide agglutination to confirm and serotype.
11. The full identification of *Shigella spp*. requires the performance of serotyping. Whenever the Microgen Identification Software suggests an identification of *Shigella*, the following additional comment will be

displayed: ‘*Shigella* species cannot be identified using biochemistry alone, perform serology to confirm the species type.’

- If the Glucose reaction is negative for any isolate being identified using the oxidase negative databases, the Microgen Identification Software will display a comment stating: ‘Isolate is GLUCOSE NEGATIVE – it is recommended that you check it is not OXIDASE POSITIVE’

10 QUALITY CONTROL

The performance of the Microgen GN-ID system should be monitored using appropriate control strains. The following cultures are recommended for independent laboratory assessment:

- *Acinetobacter baumannii* ATCC 19606
- *Proteus mirabilis* NCIMB 13283
- *Escherichia coli* ATCC 25922
- *P. stuartii* ATCC 49809

	GNA												GNB													
	L Y S	O R N	H 2 S	G L U	M A N	X Y L	O N P	I N D	U R E	V P	C I T	T D A	N I T	G E L	M A L	I N O	S O R	R H A	S U C	L A C	A R A	A D O	R D A	S A F	A A L	A R G
<i>A.baumannii</i> ATCC 19606	-	-	-	+	-	+	-	-	-	-	+	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-
<i>P.mirabilis</i> NCIMB 13283	-	+	+	+	-	+	-	-	+	+	V	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
<i>E.coli</i> ATCC 25922	+	+	-	+	+	+	+	+	-	-	-	-	+	-	-	-	+	+	-	+	+	-	-	-	-	+
<i>P. stuartii</i> ATCC 49809	-	-	-	+	-	-	-	+	-	-	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-

11 DATABASE

The Microgen GN-ID systems are based on standard biochemical testing methods. The data provided for interpretation of reaction profiles is based on established literature sources (2; 3; 4)

12 WASTE DISPOSAL

Dispose of according to any local, national, or regional regulations.

13 PRODUCT WARRANTIES, SATISFACTION GUARANTEE

Gold Standard Diagnostics Budapest (“GSDB”) warrants that the products manufactured by it will be free of defects in materials and workmanship, when used in accordance with the applicable instructions before the expiration date marked on the product packaging, and when stored under the storage conditions recommended in the instructions and/or on the package.

GSDB makes no other warranty, expressed or implied.

GSDB’s sole obligation shall be, at its option, to either replace or to refund the purchase price of the product(s) or part thereof that proves defective in materials or workmanship within the warranty period, provided the customer notifies GSDB promptly of any such defect within a reasonable time and with solid proof of the defect.

GSDB shall investigate the defect locally and will justify the approval or disapproval of the complaint. GSDB shall

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not be liable for any direct, indirect or consequential damages resulting from economic loss or property damages sustained by buyer or any customer from the use of the product(s).

A copy of the terms and conditions can be obtained on request and is also provided in our price lists.

14 IMPORTANT NOTES

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15 REFERENCES

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16 SUBSTRATE REFERENCE TABLE

Well	Reaction	Description	Positive	Negative
1	Lysine	Lysine decarboxylase - Bromothymol blue changes to green/blue indicating the production of the amine cadaverine.	Green / Blue	Yellow
2	Ornithine	Ornithine decarboxylase - Bromothymol blue changes to blue indicating the production of the amine putrescine.	Blue	Yellow / Green
3	H ₂ S	H ₂ S production - Thiosulphate is reduced to H ₂ S that reacts with ferric salts producing a black precipitate.	Brown/ Black	Straw
4	Glucose	Fermentation - Bromothymol blue changes from blue to yellow as a result of acid produced from the carbohydrate fermentation.	Yellow	Blue / Green
5	Mannitol			
6	Xylose			
7	ONPG	Hydrolysis - ONPG hydrolysis by B-galactosidase results in the production of yellow ortho-nitrophenol.	Yellow	Colourless

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Well	Reaction	Description	Positive	Negative
7a	NITRATE (for oxidase positive organisms)	Reduction of Nitrate to Nitrite is indicated by the formation of a red colour on addition of Nitrate A and B Reagents	Red	Colourless /yellow
7b	NITRATE (for oxidase positive organisms)	If nitrate has been completely reduced to Nitrogen, 7a will remain colourless/yellow – addition of zinc powder will confirm complete reduction	Colourless/ yellow	Red
8	Indole	Indole is produced from tryptophan and gives a pink/red complex when Kovac’s reagent is added.	Pink / Red	Colourless
9	Urease	Hydrolysis of urea results in the formation of ammonia leading to an increase in pH which turns phenol red from yellow to pink / red.	V. Deep Pink	Straw to pale salmon pink colour
10	VP	Acetoin production from glucose is detected by the formation of a pink / red complex after the addition of alpha naphthol and creatine in the presence of KOH.	Deep Pink / Red	Colourless to Pale Pink
11	Citrate	Utilisation of citrate (only carbon source) leading to a pH increase giving a colour change in bromothymol blue from green to blue.	Blue	Yellow/ Green
12	TDA	Indolepyruvic acid is produced from tryptophan by tryptophan deaminase giving a cherry red colour when ferric ions are added. Indole positive isolates may give a brown colour – this is a negative result.	Cherry red/dark brown	Straw colour
13	Gelatin	Proteolytic enzymes liquefy gelatin resulting in black particles being dispersed throughout the well.	Black	Colourless
14	Malonate	Inhibition of the conversion of succinic acid to fumaric acid occurs when sodium malonate is the only source of carbon. An isolate incapable of using this substrate results in the accumulation of succinic acid and the organism does not grow. A positive reaction is the result of the use of sodium malonate at the same time that ammonium sulphate is used as the nitrogen source giving sodium hydroxide which increases the alkalinity giving a blue colour.	Blue	Yellow
15	Inositol	Fermentation - Bromothymol blue changes from blue to yellow as a result of acid produced from the carbohydrate fermentation.	Yellow	Blue
16	Sorbitol			
17	Rhamnose			
18	Sucrose			
19	Lactose			
20	Arabinose			
21	Adonitol			
22	Raffinose			
23	Salicin			
24	Arginine	Arginine is converted to ornithine, ammonia and CO ₂ by arginine dihydrolase resulting in an increase in pH and a change in colour of the bromothymol blue from green to blue. At 48 hours green reactions are negative.	Green-Blue	Yellow-Green

17 LIST OF SPECIES IDENTIFIED

17.1 SPECIES IDENTIFIED USING GN A MICROWELL TEST STRIP

<i>Acinetobacter baumannii</i>	<i>Citrobacter diversus/ koseri</i>	<i>Morganella morganii</i>
<i>Shigella Serogroups A,B and C</i>	<i>Klebsiella oxytoca</i>	<i>Serratia marcescens</i>
<i>Salmonella species</i>	<i>Salmonella gallinarum /</i>	<i>Pantoea agglomerans</i>
<i>Acinetobacter Iwoffii</i>	<i>Salmonella enterica subsp.</i>	<i>Proteus mirabilis</i>
<i>Shigella sonnei (Group D)</i>	<i>enterica serovar Gallinarum</i>	<i>Serratia liquefaciens</i>
<i>Salmonella typhi/ Salmonella</i>	<i>Edwardsiella tarda</i>	<i>Enterobacter gergoviae /</i>
<i>enterica subsp. enterica serovar</i>	<i>Klebsiella ozaenae</i>	<i>Pluralibacter gergoviae</i>
<i>Typhi</i>	<i>Salmonella pullorum / Salmonella</i>	<i>Proteus vulgaris</i>
<i>Acinetobacter haemolyticus</i>	<i>enterica subsp. enterica serovar</i>	<i>Serratia rubidaea</i>
<i>Hafnia alvei</i>	<i>Pullorum</i>	<i>Enterobacter sakazakii /</i>
<i>Salmonella cholerae-suis /</i>	<i>Enterobacter aerogenes /</i>	<i>Cronobacter sakazakii</i>
<i>Salmonella enterica subsp.</i>	<i>Klebsiella aerogenes</i>	<i>Providencia rettgeri</i>
<i>enterica serovar Choleraesuis</i>	<i>Klebsiella rhinoscleromatis /</i>	<i>Yersinia enterocolitica</i>
<i>Citrobacter freundii</i>	<i>Klebsiella pneumoniae subsp.</i>	<i>Escherichia coli</i>
<i>Klebsiella pneumoniae</i>	<i>rhinoscleromatis</i>	<i>Providencia stuartii</i>
<i>Salmonella paratyphi A /</i>	<i>Salmonella arizonae / Salmonella</i>	<i>Escherichia coli – inactive</i>
<i>Salmonella enterica subsp.</i>	<i>enterica subsp. arizonae</i>	<i>Providencia alcalifaciens</i>
<i>enterica serovar Paratyphi A</i>	<i>Enterobacter cloacae</i>	

17.2 SPECIES IDENTIFIED USING THE GN A + GN B MICROWELL TEST STRIPS.

In addition to the species listed above, the following species may be identified using the combined GN A + B microwell test strips.

17.2.1 OXIDASE NEGATIVE NON-FASTIDIOUS GRAM-NEGATIVE BACILLI

<i>Acinetobacter baumannii</i>	<i>Citrobacter gillenii</i>	<i>Escherichia hermannii</i>
<i>Acinetobacter Iwoffii</i>	<i>Citrobacter Group 137</i>	<i>Escherichia vulneris</i>
<i>Acinetobacter haemolyticus</i>	<i>Edwardsiella tarda</i>	<i>Escherichia blattae / Shimwellia</i>
<i>Averyella dalhousiensis</i>	<i>Edwardsiella tarda biogp 1</i>	<i>blattae</i>
<i>Budvicia aquatica</i>	<i>Edwardsiella hoshinae</i>	<i>Shigella Serogroups A,B,C</i>
<i>Buttiauxella agrestis</i>	<i>Edwardsiella ictaluri</i>	<i>Shigella sonnei (Group D)</i>
<i>Buttiauxella brennerae</i>	<i>Enterobacter aerogenes</i>	<i>Ewingella americana</i>
<i>Buttiauxella ferrugutiae</i>	<i>Enterobacter cloacae</i>	<i>Hafnia alvei</i>
<i>Buttiauxella gaviniae</i>	<i>Enterobacter agglomerans</i>	<i>Hafnia alvei biogp 1</i>
<i>Buttiauxella izardi</i>	<i>Enterobacter gergoviae/</i>	<i>Klebsiella pneumoniae</i>
<i>Buttiauxella noackiae</i>	<i>Pluralibacter gergoviae</i>	<i>Klebsiella oxytoca</i>
<i>Butiauxella wamboldiae</i>	<i>Enterobacter sakazakii</i>	<i>Klebsiella ornithinolytica /</i>
<i>Cedecea davisae</i>	<i>Enterobacter taylorae</i>	<i>Raoultella ornithinolytica</i>
<i>Cedecea lapagei</i>	<i>(cancerogenus)</i>	<i>Klebsiella ozaenae</i>
<i>Cedecea neteri</i>	<i>Enterobacter amnigenus biogp 1</i>	<i>Klebsiella rhinoscleromatis/</i>
<i>Cedecea sp 3</i>	<i>Enterobacter amnigenus biogp 2</i>	<i>Klebsiella pneumoniae subsp.</i>
<i>Cedecea sp 5</i>	<i>Enterobacter asburiae</i>	<i>rhinoscleromatis</i>
<i>Citrobacter freundii</i>	<i>Enterobacter hormaechei</i>	<i>Klebsiella terrigena /</i>
<i>Citrobacter diversus/koseri</i>	<i>Enterobacter cancerogenus</i>	<i>Raoultella terrigena</i>
<i>Citrobacter amalonaticus</i>	<i>Enterobacter dissolvens</i>	<i>Kluyvera ascorbata</i>
<i>Citrobacter farmeri</i>	<i>Enterobacter nimipressuralis</i>	<i>Kluyvera cryocrescens</i>
<i>Citrobacter youngae</i>	<i>Enterobacter pyrinus /</i>	<i>Kluyvera georgiana</i>
<i>Citrobacter braakii</i>	<i>Pluralibacter pyrinus</i>	<i>Kluyvera intermedia</i>
<i>Citrobacter werkmanii</i>	<i>Escherichia coli</i>	<i>Leclercia adecarboxylata</i>
<i>Citrobacter sedlakii</i>	<i>Escherichia coli - inactive</i>	<i>Leminorella grimontii</i>
<i>Citrobacter rodentium</i>	<i>Escherichia fergusonii</i>	<i>Leminorella richardii</i>

Moellerella wisconsensis
Morganella morganii
Morganella morganii ss *morganii*
Morganella morganii biogp 1
Morganella morganii ss *Sibonii* 1 /
Morganella morganii subsp. *sibonii*
Obesumbacterium proteus biogp 2
Pragia fontium
Pantoea dispersa
Pantoea agglomerans
Photorhabdus luminescens (25C)
Photorhabdus asymbiotica
Proteus mirabilis
Proteus vulgaris
Proteus penneri
Proteus myxofaciens
Providencia rettgeri
Providencia stuartii
Providencia alcalifaciens
Providencia rustigianii
Providencia heimbachae
Rahnella aquatilis
Salmonella enterica Group I
Salmonella serotype Typhi

Salmonella Cholerae-suis /
Salmonella enterica subsp.
enterica serovar *Choleraesuis*
Salmonella Paratyphi A /
Salmonella enterica subsp.
enterica serovar *Paratyphi* A
Salmonella gallinarum /
Salmonella enterica subsp.
enterica serovar *Gallinarum*
Salmonella pullorum / *Salmonella*
enterica subsp. *enterica* serovar
Pullorum
Salmonella Group II
Salmonella Group IIIa
Salmonella Group IIIb
Salmonella Group IV
Salmonella bongori (Group V)
Salmonella Group VI
Serratia marcescens
Serratia marcescens biogp 1
Serratia liquefaciens
Serratia rubidaea
Serratia odorifera biogp 1
Serratia odorifera biogp 2
Serratia plymuthica
Serratia ficaria
Serratia entomophila

Serratia fonticola
Tatumella ptyseos
Trabulsiella guamensis
Xenorhabdus nematophilis (25°C)
Xenorhabdus nematophila (25°C)
Xanthomonas
(Stenotrophomonas) maltophilia /
Stenotrophomonas maltophilia
Yersinia enterocolitica
Yersinia frederiksenii
Yersinia intermedia
Yersinia kristensenii
Yersinia rohdei
Yersinia aldovae
Yersinia bercovieri
Yersinia mollaretii
Yersinia pestis
Yersinia pseudotuberculosis
Yersinia ruckeri
Yokenella regensburgei
Enteric Gp59
Enteric Gp60
Enteric Gp63
Enteric Gp64
Enteric Gp68
Enteric Gp69

17.2.2 OXIDASE POSITIVE NON-FASTIDIOUS GRAM-NEGATIVE BACILLI

Pseudomonas aeruginosa
Pseudomonas fluorescens 25°C
Pseudomonas fluorescens 37°C
Burkholderia cepacia
Pseudomonas putida
Pseudomonas stutzeri
Pseudomonas diminuta
Burkholderia pseudomallei
Shewanella putrefaciens
Alcaligenes faecalis type 11
Alcaligenes faecalis
Alcaligenes xylosoxidans ss *xylos* /
Achromobacter xylosoxidans
Flavobacterium meningosepticum
/Elizabethkingia meningoseptica

Flavobacterium odoratum /
Myroides odoratus
Flavobacterium breve /
Empedobacter brevis
Flavobacterium oindologenes /
Chryseobacterium indologenes
Vibrio fluvialis
Vibrio furnissii
Vibrio mimicus
Vibrio vulnificus
Vibrio hollisae / *Grimontia hollisae*
Vibrio cholerae
Vibrio parahaemolyticus
Vibrio alginolyticus
Vibrio cincinnatiensis

Vibrio damsela / *Photobacterium*
damselae
Vibrio carchariae
Moraxella spp.
Plesiomonas shigelloides
Aeromonas hydrophila
Aeromonas veronii bio *sobria*
Aeromonas veronii bio *veronii*
Aeromonas caviae
Weeksella virosa
Weeksella zoohelcum / *Bergeyella*
zoohelcum
Pasteurella multocida
Pasteurella haemolytica /
Mannheimia haemolytica
Actinobacillus spp.

18 COMMONLY ENCOUNTERED GRAM-NEGATIVE DATA TABLE

COMMONLY ENCOUNTERED GRAM NEGATIVE DATA TABLE

	LYS	ORN	H2S	GLU	MAN	XYL	ONP	IND	UR	VP	CIT	TDA
<i>Acinetobacter baumannii</i>	60	8	0.1	99.9	0.1	97	0.1	0.1	9	0.1	99.9	0.1
<i>Acinetobacter Iwoffii</i>	40	0.1	0.1	6	0.1	0.1	0.1	0.1	3	0.1	0.1	0.1
<i>Acinetobacter haemolyticus</i>	40	0.1	0.1	0.1	0.1	0.1	0.1	0.1	3	0.1	9	0.1
<i>Citrobacter freundii</i>	0.1	0.1	78	99.9	99.9	89	89	33	44	0.1	78	0.1
<i>Citrobacter diversus / koseri</i>	0.1	99	0.1	99.9	99	99.9	99	99	75	0.1	99	0.1
<i>Edwardsiella tarda</i>	99.9	99.9	99.9	99.9	0.1	0.1	0.1	99	0.1	0.1	1	0.1
<i>Enterobacter aerogenes</i>	98	98	0.1	99.9	99.9	99.9	99.9	0.1	2	98	95	0.1
<i>Enterobacter cloacae</i>	0.1	96	0.1	99.9	99.9	99	99	0.1	65	99.9	99.9	0.1
<i>Pantoea agglomerans</i>	0.1	0.1	0.1	99.9	99.9	93	90	20	20	70	50	20
<i>Enterobacter gergoviae</i>	90	99.9	0.1	99.9	99	99	97	0.1	93	99.9	99	0.1
<i>Enterobacter sakazakii</i>	0.1	91	0.1	99.9	99.9	99.9	99.9	11	1	99.9	99	50
<i>Escherichia coli</i>	85	85	1	99.9	98	95	95	99.9	1	0.1	1	0.1
<i>Escherichia coli</i> - inactive	40	20	1	99.9	93	70	45	80	1	0.1	1	0.1
<i>Shigella</i> Serogroups A,B&C	0.1	1	0.1	99.9	93	2	2	50	0.1	0.1	0.1	0.1
<i>Shigella sonnei</i> (Group D)	0.1	98	0.1	99.9	99	2	90	0.1	0.1	0.1	0.1	0.1
<i>Haflnia alvei</i>	99.9	98	0.1	99.9	99	98	90	0.1	4	85	10	0.1
<i>Klebsiella pneumoniae</i>	98	0.1	0.1	99.9	99	99	99	0.1	95	98	98	0.1
<i>Klebsiella oxytoca</i>	99	0.1	0.1	99.9	99	99.9	99.9	99	90	95	95	1
<i>Klebsiella ozaenae</i>	40	3	0.1	99.9	99.9	95	80	0.1	10	0.1	30	0.1
<i>Klebsiella rhinoscleromatis</i>	0.1	0.1	0.1	99.9	99.9	99.9	0.1	0.1	0.1	0.1	0.1	0.1
<i>Morganella morganii</i>	24	97	0.1	99.9	0.1	0.1	0.1	99	98	0.1	0.1	95
<i>Proteus mirabilis</i>	0.1	99	98	99.9	0.1	98	0.1	2	98	50	65	98
<i>Proteus vulgaris</i>	0.1	0.1	95	99.9	0.1	95	1	98	95	0.1	15	99
<i>Providencia rettgeri</i>	0.1	0.1	0.1	99.9	99.9	10	5	99	98	0.1	95	98
<i>Providencia stuartii</i>	0.1	0.1	0.1	99.9	10	7	10	98	30	0.1	93	95
<i>Providencia alcalifaciens</i>	0.1	1	0.1	99.9	2	1	1	99	0.1	0.1	98	98
<i>Salmonella</i> species	98	97	95	99.9	99.9	97	2	1	1	0.1	95	0.1
<i>Salmonella Typhi</i>	98	0.1	97	99.9	99.9	82	0.1	0.1	0.1	0.1	0.1	0.1
<i>Salmonella Choleraesuis</i>	95	99.9	50	99.9	98	98	0.1	0.1	0.1	0.1	25	0.1
<i>Salmonella Paratyphi A</i>	0.1	95	10	99.9	99.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<i>Salmonella Gallinarum</i>	90	1	99.9	99.9	99.9	70	0.1	0.1	0.1	0.1	0.1	0.1
<i>Salmonella Pullorum</i>	99.9	95	90	99.9	99.9	90	0.1	0.1	0.1	0.1	0.1	0.1
<i>Salmonella Arizonae</i>	99	99	99	99.9	99.9	99.9	92	2	0.1	0.1	98	0.1
<i>Serratia marcescens</i>	99	99	0.1	99.9	99	7	95	1	15	98	98	0.1
<i>Serratia liquefaciens</i>	95	95	0.1	99.9	99.9	99.9	93	1	3	93	90	0.1
<i>Serratia rubidaea</i>	55	0.1	0.1	99.9	99.9	99	99.9	0.1	2	99.9	95	0.1
<i>Yersinia enterocolitica</i>	0.1	95	0.1	99.9	98	70	95	50	90	2	0.1	0.1

19 EXTENDED OXIDASE NEGATIVE DATA TABLE

	LYS	ORN	H2S	GLU	MAN	XVL	ONP	IND	UR	VP	CIT	TDA	GEL	MAL	INO	SOR	RHA	SUC	LAC	ARA	ADO	RAF	SAL	ARG
<i>Acinetobacter baumannii</i>	60	8	0.1	99.9	0.1	97	0.1	0.1	9	0.1	99.9	0.1	0.1	98	0.1	0.1	0.1	0.1	0.1	87	0.1	0.1	0.1	0.1
<i>Acinetobacterwoffii</i>	40	0.1	0.1	6	0.1	0.1	0.1	0.1	3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6
<i>Acinetobacter haemolyticus</i>	40	0.1	0.1	0.1	0.1	0.1	0.1	0.1	3	0.1	9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6
<i>Aerveyella dalhousiensis</i>	99.9	85	0.1	99.9	99.9	99.9	99.9	0.1	70	0.1	85	0.1	0.1	85	0.1	99.9	99.9	0.1	30	99.9	0.1	0.1	99.9	0.1
<i>Bordetia aquatica</i>	0.1	0.1	80	99.9	60	93	93	0.1	33	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	99.9	0.1	87	80	0.1	0.1
<i>Buttiauxella agrestis</i>	0.1	99.9	0.1	99.9	99.9	99.9	99.9	0.1	0.1	0.1	99.9	0.1	0.1	60	0.1	0.1	99.9	0.1	99.9	99.9	0.1	99.9	99.9	0.1
<i>Buttiauxella brennerae</i>	0.1	33	0.1	99.9	99.9	99.9	99.9	0.1	0.1	0.1	0.1	0.1	0.1	99.9	0.1	0.1	33	0.1	67	99.9	67	99.9	99.9	0.1
<i>Buttiauxella ferruginea</i>	99.9	80	0.1	99.9	99.9	99.9	99.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	99.9	99.9	0.1	0.1	99.9	0.1	0.1	99.9	0.1
<i>Buttiauxella gaviniae</i>	0.1	0.1	0.1	99.9	99.9	99.9	99.9	0.1	0.1	0.1	20	0.1	0.1	0.1	0.1	0.1	99.9	0.1	60	99.9	99.9	0.1	99.9	20
<i>Buttiauxella izardi</i>	0.1	99.9	0.1	99.9	99.9	99.9	99.9	0.1	0.1	0.1	0.1	0.1	0.1	99.9	0.1	0.1	99.9	0.1	99.9	99.9	0.1	33	99.9	0.1
<i>Buttiauxella noackiae</i>	0.1	0.1	0.1	99.9	99.9	99.9	99.9	33	0.1	0.1	33	99.9	0.1	99.9	0.1	0.1	99.9	0.1	0.1	99.9	0.1	0.1	99.9	67
<i>Buttiauxella wamboldiae</i>	0.1	0.1	0.1	99.9	99.9	99.9	99.9	0.1	0.1	0.1	33	99.9	0.1	99.9	67	0.1	99.9	0.1	0.1	99.9	0.1	0.1	99.9	0.1
<i>Cedecea devisa</i>	0.1	95	0.1	99.9	99.9	99.9	99.9	0.1	0.1	50	95	0.1	0.1	91	0.1	0.1	99.9	19	0.1	0.1	0.1	10	99	50
<i>Cedecea lapagei</i>	0.1	0.1	0.1	99.9	99.9	0.1	99	0.1	0.1	80	99	0.1	0.1	99	0.1	0.1	0.1	0.1	60	0.1	0.1	0.1	99.9	80
<i>Cedecea neteri</i>	0.1	0.1	0.1	99.9	99.9	99.9	99.9	0.1	0.1	50	99.9	0.1	0.1	99.9	0.1	99.9	0.1	99.9	35	0.1	0.1	0.1	99.9	99.9
<i>Cedecea sp 3</i>	0.1	0.1	0.1	99.9	99.9	99.9	99.9	0.1	0.1	50	99.9	0.1	0.1	0.1	0.1	0.1	0.1	50	0.1	0.1	0.1	99.9	99.9	99.9
<i>Cedecea sp 5</i>	0.1	50	0.1	99.9	99.9	99.9	99.9	0.1	0.1	50	99.9	0.1	0.1	0.1	0.1	0.1	99.9	0.1	0.1	0.1	0.1	99.9	99.9	50
<i>Citrobacter freundii</i>	0.1	0.1	78	99.9	99.9	89	89	33	44	0.1	78	0.1	0.1	11	0.1	99.9	99.9	89	78	99.9	0.1	44	0.1	67
<i>Citrobacter diversus / koseri</i>	0.1	99	0.1	99.9	99	99.9	99	99	75	0.1	99	0.1	0.1	95	0.1	99	99	40	50	99	99	0.1	15	80
<i>Citrobacter amalonoticus</i>	0.1	95	5	99.9	99.9	99	97	99.9	85	0.1	95	0.1	0.1	1	0.1	99	99.9	9	35	99	0.1	5	30	85
<i>Citrobacter farmeri</i>	0.1	99.9	0.1	99.9	99.9	99.9	99.9	99.9	59	0.1	10	0.1	0.1	0.1	0.1	98	99.9	99.9	15	99.9	0.1	99.9	9	85
<i>Citrobacter youngae</i>	0.1	5	65	99.9	99.9	99.9	90	15	80	0.1	75	0.1	0.1	5	5	99.9	99.9	20	25	99.9	0.1	10	10	50
<i>Citrobacter braakii</i>	0.1	93	80	99.9	99.9	99.9	80	33	67	0.1	87	0.1	0.1	0.1	0.1	99.9	99.9	7	80	99.9	0.1	7	0.1	67
<i>Citrobacter werkmanii</i>	0.1	0.1	99.9	99.9	99.9	99.9	99.9	0.1	99.9	0.1	99.9	0.1	0.1	99.9	0.1	99.9	99.9	0.1	17	99.9	0.1	0.1	0.1	99.9
<i>Citrobacter sedlakii</i>	0.1	99.9	0.1	99.9	99.9	99.9	99.9	83	99.9	0.1	83	0.1	0.1	99.9	0.1	99.9	99.9	0.1	99.9	99.9	0.1	0.1	17	99.9
<i>Citrobacter rosentium</i>	0.1	99.9	0.1	99.9	99.9	99.9	99.9	0.1	99.9	0.1	0.1	0.1	0.1	99.9	0.1	99.9	99.9	0.1	99.9	99.9	0.1	0.1	0.1	0.1
<i>Citrobacter gillenii</i>	0.1	0.1	67	99.9	99.9	99.9	67	0.1	0.1	33	0.1	0.1	0.1	99.9	0.1	99.9	99.9	33	67	99.9	0.1	0.1	0.1	33
<i>Citrobacter Group 137</i>	0.1	99.9	0.1	99.9	99.9	99.9	99.9	99.9	70	0.1	0.1	0.1	0.1	0.1	0.1	99.9	99.9	99.9	99.9	99.9	0.1	99.9	99.9	20
<i>Edwardsiella tarda</i>	99.9	99.9	99.9	99.9	0.1	0.1	0.1	99	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	9	0.1	0.1	0.1	0.1
<i>Edwardsiella tarda biog 1</i>	99.9	99.9	0.1	99.9	99.9	0.1	0.1	99.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	99.9	0.1	99.9	0.1	0.1	0.1	0.1
<i>Edwardsiella hosikae</i>	99.9	95	0.1	99.9	99.9	0.1	0.1	50	0.1	0.1	0.1	0.1	0.1	99.9	0.1	0.1	0.1	99.9	0.1	13	0.1	0.1	50	0.1
<i>Edwardsiella ictaluri</i>	99.9	65	0.1	99.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<i>Enterobacter aerogenes</i>	98	98	0.1	99.9	99.9	99.9	99.9	0.1	2	98	95	0.1	0.1	95	95	99.9	99	99.9	95	99.9	98	96	99.9	0.1
<i>Enterobacter cloacae</i>	0.1	96	0.1	99.9	99.9	99	99	0.1	65	99.9	99.9	0.1	0.1	75	15	95	92	97	93	99.9	25	97	75	97
<i>Pantoea agglomerans</i>	0.1	0.1	0.1	99.9	99.9	93	90	20	20	70	50	20	2	65	15	30	85	75	40	95	7	30	65	0.1
<i>Enterobacter gergoviae</i>	90	99.9	0.1	99.9	99	99	97	0.1	93	99.9	99	0.1	0.1	96	0.1	0.1	99	99	55	99	0.1	97	99	0.1
<i>Enterobacter sakazakii</i>	0.1	91	0.1	99.9	99.9	99.9	99.9	11	1	99.9	99	50	0.1	18	75	0.1	99.9	99.9	99	99.9	0.1	99	99	99
<i>Enterobacter taylorae (cancerogenus)</i>	0.1	99	0.1	99.9	99.9	99.9	99.9	0.1	1	99.9	99.9	0.1	0.1	99.9	0.1	1	99.9	0.1	10	99.9	0.1	0.1	92	94
<i>Enterobacter amnigenus biog 1</i>	0.1	55	0.1	99.9	99.9	99.9	91	0.1	0.1	99.9	70	0.1	0.1	91	0.1	9	99.9	99.9	70	99.9	0.1	99.9	91	9
<i>Enterobacter amnigenus biog 2</i>	0.1	99.9	0.1	99.9	99.9	99.9	99.9	0.1	0.1	99.9	99.9	0.1	0.1	99.9	0.1	99.9	99.9	0.1	35	99.9	0.1	0.1	99.9	35
<i>Enterobacter asburiae</i>	0.1	95	0.1	99.9	99.9	97	99.9	0.1	60	2	99.9	0.1	0.1	3	0.1	99.9	5	99.9	75	99.9	0.1	70	99.9	21
<i>Enterobacter hormaechei</i>	0.1	91	0.1	99.9	99.9	96	95	0.1	87	99.9	96	4	0.1	99.9	0.1	0.1	99.9	99.9	9	99.9	0.1	0.1	44	78
<i>Enterobacter cancerogenus</i>	0.1	99.9	0.1	99.9	99.9	99.9	99.9	0.1	0.1	99.9	99.9	0.1	0.1	99.9	0.1	0.1	99.9	0.1	0.1	99.9	0.1	0.1	99.9	99.9
<i>Enterobacter dissolvens</i>	0.1	99.9	0.1	99.9	99.9	99.9	99.9	0.1	99.9	99.9	99.9	0.1	0.1	99.9	0.1	99.9	99.9	99.9	0.1	99.9	0.1	99.9	99.9	99.9
<i>Enterobacter nimipressuralis</i>	0.1	99.9	0.1	99.9	99.9	99.9	99.9	0.1	0.1	99.9	0.1	0.1	0.1	99.9	0.1	99.9	99.9	0.1	0.1	99.9	0.1	0.1	99.9	0.1
<i>Enterobacter pyrinus</i>	99.9	99.9	0.1	99.9	99	0.1	99.9	0.1	86	86	0.1	0.1	0.1	86	99.9	0.1	99.9	99.9	14	99.9	0.1	0.1	99.9	0.1
<i>Escherichia coli</i>	85	85	1	99.9	98	95	95	99.9	1	0.1	1	0.1	0.1	0.1	1	94	80	50	95	99	5	50	40	17
<i>Escherichia coli - inactive</i>	40	20	1	99.9	93	70	45	80	1	0.1	1	0.1	0.1	0.1	1	75	65	15	25	85	3	15	10	3
<i>Escherichia fergusonii</i>	95	99.9	0.1	99.9	98	96	83	98	0.1	0.1	17	0.1	0.1	35	0.1	0.1	92	0.1	0.1	98	98	0.1	65	5
<i>Escherichia hermannii</i>	6	99.9	0.1	99.9	99.9	99.9	98	99	0.1	0.1	1	0.1	0.1	0.1	0.1	97	45	45	99.9	0.1	40	40	0.1	
<i>Escherichia vulneris</i>	85	0.1	0.1	99.9	99.9	99.9	99.9	0.1	0.1	0.1	0.1	0.1	0.1	85	0.1	1	93	8	15	99.9	0.1	99	30	30
<i>Escherichia blattae</i>	99.9	99.9	0.1	99.9	0.1	99.9	0.1	0.1	0.1	0.1	50	0.1	0.1	99.9	0.1	0.1	99.9	0.1	0.1	99.9	0.1	0.1	0.1	0.1
<i>Shigella Serogroups A,B&C</i>	0.1	1	0.1	99.9	93	2	2	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	30	5	0.1	0.1	60	0.1	50	0.1	5
<i>Shigella sonnei (Group D)</i>	0.1	98	0.1	99.9	99	2	90	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2	75	1	2	95	0.1	3	0.1	2	
<i>Ewingella americana</i>	0.1	0.1	0.1	99.9	99.9	13	65	0.1	0.1	95	95	0.1	0.1	0.1	0.1	0.1	23	0.1	70	0.1	0.1	0.1	80	0.1
<i>Hafnia alvei</i>	99.9	98	0.1	99.9	99	98	90	0.1	4	85	10	0.1	0.1	50	0.1	0.1	97	10	5	95	0.1	2	13	6
<i>Hafnia alvei biog 1</i>	99.9	45	0.1	99.9	55	0.1	30	0.1	0.1	70	0.1													

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<i>Klebsiella terrigena</i>	99.9	20	0.1	99.9	99.9	99.9	99.9	0.1	0.1	99.9	40	0.1	0.1	99.9	80	99.9	99.9	99.9	99.9	99.9	99.9	99.9	0.1		
<i>Kluyvera ascorbata</i>	97	99.9	0.1	99.9	99.9	99	99.9	92	0.1	0.1	96	0.1	0.1	96	0.1	40	99.9	98	98	99.9	0.1	98	99.9	0.1	
<i>Kluyvera cryocrescens</i>	23	99.9	0.1	99.9	95	91	99.9	90	0.1	0.1	80	0.1	0.1	86	0.1	45	99.9	81	95	99.9	0.1	99.9	99.9	0.1	
<i>Kluyvera georgiana</i>	99.9	99.9	0.1	99.9	99.9	99.9	99.9	99.9	0.1	0.1	99.9	0.1	0.1	50	0.1	0.1	83	99.9	83	99.9	0.1	99.9	99.9	0.1	
<i>Kluyvera intermedii</i>	0.1	89	0.1	99.9	99.9	99.9	99.9	0.1	0.1	99.9	65	0.1	0.1	99.9	0.1	99.9	99.9	65	99.9	99.9	0.1	99.9	99.9	0.1	
<i>Leclercia adecarboxylata</i>	0.1	0.1	0.1	99.9	99.9	99.9	99.9	99.9	48	0.1	0.1	0.1	0.1	93	0.1	0.1	99.9	66	93	99.9	93	66	99.9	0.1	
<i>Leminorella grimaldii</i>	0.1	0.1	99.9	99.9	0.1	83	0.1	0.1	0.1	0.1	99.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	99.9	0.1	0.1	0.1	0.1	
<i>Leminorella richardii</i>	0.1	0.1	99.9	99.9	0.1	99.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	99.9	0.1	0.1	0.1	
<i>Moraxella wisconsinensis</i>	0.1	0.1	0.1	99.9	60	0.1	90	0.1	0.1	0.1	80	0.1	0.1	0.1	0.1	0.1	0.1	0.1	99.9	99.9	0.1	99.9	99.9	0.1	
<i>Morganella morganii</i>	24	97	0.1	99.9	0.1	0.1	0.1	99	98	0.1	0.1	95	0.1	4	0.1	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	
<i>Morganella morganii</i> ss <i>Morganii</i>	1	95	20	99.9	0.1	0.1	10	95	95	0.1	0.1	95	0.1	1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1	
<i>Morganella morganii</i> biog 1	99.9	80	15	99.9	0.1	0.1	20	99.9	99.9	0.1	0.1	99.9	0.1	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
<i>Morganella morganii</i> ss <i>Sibiou</i> 1	29	64	7	99.9	0.1	0.1	0.1	50	99.9	0.1	0.1	93	0.1	0.1	0.1	0.1	0.1	7	0.1	0.1	0.1	0.1	0.1	0.1	
<i>Obesumbacterium proteus</i> biog 2	99.9	99.9	0.1	99.9	0.1	15	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	15	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
<i>Pegivia fontium</i>	0.1	0.1	89	99.9	0.1	0.1	0.1	0.1	0.1	0.1	89	22	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	78	0.1	
<i>Photobacterium luminescens</i> (25C)	0.1	0.1	0.1	99.9	0.1	0.1	0.1	50	25	0.1	50	0.1	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
<i>Photobacterium asymbioticum</i>	0.1	0.1	0.1	99.9	0.1	0.1	0.1	60	0.1	20	0.1	80	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
<i>Proteus mirabilis</i>	0.1	99	98	99.9	0.1	98	0.1	2	98	50	65	99	90	2	0.1	0.1	1	15	2	0.1	0.1	1	0.1	0.1	
<i>Proteus vulgaris</i>	0.1	0.1	95	99.9	0.1	95	1	98	95	0.1	15	99	91	0.1	0.1	0.1	5	97	2	0.1	0.1	1	50	0.1	
<i>Proteus penneri</i>	0.1	0.1	30	99.9	0.1	99.9	1	0.1	99.9	0.1	0.1	99	50	0.1	0.1	0.1	0.1	99.9	1	0.1	0.1	1	0.1	0.1	
<i>Proteus myofaciens</i>	0.1	0.1	0.1	99.9	0.1	0.1	0.1	0.1	99.9	99.9	50	99.9	99.9	0.1	0.1	0.1	0.1	99.9	0.1	0.1	0.1	0.1	0.1	0.1	
<i>Providencia rettgeri</i>	0.1	0.1	0.1	99.9	99.9	10	5	99	98	0.1	95	98	0.1	0.1	90	1	70	15	5	0.1	99.9	5	50	0.1	
<i>Providencia sabbatii</i>	0.1	0.1	0.1	99.9	10	7	10	99	30	0.1	93	95	0.1	0.1	95	1	0.1	50	2	1	5	7	2	0.1	
<i>Providencia alcalifaciens</i>	0.1	1	0.1	99.9	2	1	1	99	0.1	0.1	98	98	0.1	0.1	1	1	0.1	15	0.1	1	98	1	1	0.1	
<i>Providencia rustigianii</i>	0.1	0.1	0.1	99.9	0.1	0.1	0.1	98	0.1	0.1	15	99.9	0.1	0.1	0.1	0.1	0.1	35	0.1	0.1	0.1	0.1	0.1	0.1	
<i>Providencia heimbachae</i>	0.1	0.1	0.1	99.9	0.1	8	0.1	0.1	0.1	0.1	99.9	0.1	0.1	0.1	46	0.1	99.9	0.1	0.1	0.1	92	0.1	0.1	0.1	
<i>Rahnella aquabilis</i>	0.1	0.1	0.1	99.9	99.9	94	99.9	0.1	0.1	99.9	94	95	0.1	99.9	0.1	94	94	99.9	99.9	99.9	0.1	94	99.9	0.1	
<i>Salmonella enterica</i> (Group I)	98	97	95	99.9	99.9	97	2	1	1	0.1	95	0.1	0.1	0.1	35	95	95	1	1	99	0.1	2	0.1	70	
<i>Salmonella serotype</i> <i>Typhii</i>	98	0.1	97	99.9	99.9	82	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	99	0.1	0.1	1	2	0.1	0.1	0.1	3		
<i>Salmonella serotype</i> <i>Choleraesuis</i>	95	99.9	50	99.9	98	98	0.1	0.1	0.1	25	0.1	0.1	0.1	0.1	0.1	90	99.9	0.1	0.1	0.1	0.1	1	0.1	55	
<i>Salmonella serotype</i> <i>Paratyphi</i> A	0.1	95	10	99.9	99.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	95	99.9	0.1	0.1	99.9	0.1	0.1	0.1	15	
<i>Salmonella serotype</i> <i>Gallinarum</i>	90	1	99.9	99.9	99.9	70	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	10	0.1	0.1	80	0.1	10	0.1	10		
<i>Salmonella serotype</i> <i>Pullorum</i>	99.9	95	90	99.9	99.9	90	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	10	99.9	0.1	0.1	99.9	0.1	1	0.1	10		
<i>Salmonella</i> Group II	99.9	99.9	99.9	99.9	99.9	99.9	15	2	0.1	0.1	99.9	0.1	2	95	5	99.9	99.9	1	1	99.9	0.1	0.1	5	90	
<i>Salmonella</i> Group IIIa	99	99	99	99.9	99.9	99.9	99.9	1	0.1	0.1	99	0.1	0.1	95	0.1	99	99	1	15	99	0.1	1	0.1	70	
<i>Salmonella</i> Group IIIb	99	99	99	99.9	99.9	99.9	92	2	0.1	0.1	98	0.1	0.1	95	0.1	99	99	5	85	99	0.1	1	0.1	70	
<i>Salmonella</i> Group IV	99.9	99.9	99.9	99.9	98	99.9	0.1	0.1	2	0.1	98	0.1	0.1	0.1	0.1	99.9	98	0.1	0.1	99.9	5	0.1	60	70	
<i>Salmonella bongori</i> (Group V)	99.9	99.9	99.9	99.9	99.9	99.9	94	0.1	0.1	0.1	94	0.1	0.1	0.1	0.1	99.9	88	0.1	0.1	94	0.1	0.1	0.1	94	
<i>Salmonella</i> Group VI	99.9	99.9	99.9	99.9	99.9	99.9	44	0.1	0.1	0.1	89	0.1	0.1	0.1	0.1	0.1	99.9	0.1	22	99.9	0.1	0.1	0.1	67	
<i>Serratia marcescens</i>	99	99	0.1	99.9	99	7	95	1	15	98	98	0.1	90	3	75	99	0.1	99	2	0.1	40	2	95	0.1	
<i>Serratia marcescens</i> biog 1	55	65	0.1	99.9	98	0.1	75	0.1	0.1	60	30	0.1	30	0.1	30	92	0.1	99.9	4	0.1	30	0.1	92	4	
<i>Serratia liquefaciens</i>	95	95	0.1	99.9	99.9	99.9	93	1	3	93	90	0.1	90	2	60	95	15	98	10	98	5	85	97	0.1	
<i>Serratia rubivirens</i>	55	0.1	0.1	99.9	99.9	99	99.9	0.1	2	99.9	95	0.1	90	94	20	1	1	99	99.9	99.9	99	99	99	0.1	
<i>Serratia odorifera</i> biog 1	99.9	99.9	0.1	99.9	99.9	99.9	80	5	50	99.9	0.1	95	0.1	99.9	99.9	95	99.9	70	99.9	50	99.9	98	0.1		
<i>Serratia odorifera</i> biog 2	94	0.1	0.1	99.9	97	99.9	99.9	50	0.1	99.9	97	0.1	94	0.1	99.9	99.9	94	0.1	97	99.9	55	7	45	0.1	
<i>Serratia plymorum</i>	0.1	0.1	0.1	99.9	99.9	94	70	0.1	0.1	80	75	0.1	60	0.1	50	65	0.1	99.9	80	99.9	0.1	94	94	0.1	
<i>Serratia ficaria</i>	0.1	0.1	0.1	99.9	99.9	99.9	99.9	0.1	0.1	75	99.9	0.1	99.9	0.1	55	99.9	35	99.9	15	99.9	0.1	70	99.9	0.1	
<i>Serratia entomophila</i>	0.1	0.1	0.1	99.9	99.9	40	99.9	0.1	0.1	99.9	99.9	0.1	99.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	99.9	0.1	
<i>Serratia fonticola</i>	99.9	97	0.1	99.9	99.9	85	99.9	0.1	13	9	91	0.1	0.1	88	30	99.9	76	21	97	99.9	99.9	99.9	99.9	0.1	
<i>Serratia plymorum</i>	0.1	0.1	0.1	99.9	0.1	9	0.1	0.1	0.1	5	2	90	0.1	0.1	0.1	0.1	0.1	98	0.1	0.1	0.1	11	55	0.1	
<i>Trabulsiella guamensis</i>	99.9	99.9	99.9	99.9	99.9	99.9	99.9	40	0.1	0.1	88	0.1	0.1	0.1	0.1	99.9	99.9	0.1	0.1	99.9	0.1	0.1	13	50	
<i>Xenorhabdus nematophilis</i> (25PC)	0.1	0.1	0.1	80	0.1	0.1	0.1	40	0.1	0.1	0.1	0.1	80	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
<i>Xanthomonas</i> (<i>Stenotrophomonas</i>) <i>malloyi</i>	94	0.1	0.1	3	0.1	0.1	35	0.1	0.1	0.1	98	0.1	89	81	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	1	
<i>Yersinia enterocolitica</i>	0.1	95	0.1	99.9	98	70	95	50	90	2	0.1	0.1	0.1	0.1	30	99	1	95	5	98	0.1	5	20	0.1	
<i>Yersinia frederiksenii</i>	0.1	95	0.1	99.9	99.9	99.9	99.9	99.9	70	0.1	15	0.1	0.1	0.1	0.1	20	99.9	99	99.9	40	99.9	0.1	30	92	0.1
<i>Yersinia intermedia</i>	0.1	99.9	0.1	99.9	99.9	99.9	90	99.9	80	5	5	0.1	0.1	5	15	99.9	99.9	99.9	35	99.9	0.1	45	99.9	0.1	
<i>Yersinia kristensenii</i>	0.1	92	0.1	99.9	99.9	85	70	30	77	0.1	0.1	0.1	0.1	0.1	15	99.9	0.1	0.1	8	77	0.1	0.1	15	0.1	
<i>Yersinia ruckeri</i>	0.1	25	0.1	99.9	99.9	38	50	0.1	62	0.1	0.1	0.1	0.1	0.1	0.1	99.9	0.1	99.9	0.1	99.9	0.1	62	0.1	0.1	

20 OXIDASE POSITIVE DATA TABLE

ORGANISM	OXI	MOT	NIT	LYS	ORN	H2S	GLU	MAN	XYL	ONP	IND	UR	VP	CIT	TDA	GEL	MAL	INO	SOR	RHA	SUC	LAC	ARA	ADO	RAF	SAL	ARG
<i>Pseudomonas aeruginosa</i>	100	93	85	89	3	0	85	40	81	0	0	56	0	95	0	64	94	0	0	0	0	0	45	0	0	0	100
<i>Pseudomonas fluorescens 25°C</i>	100	94	55	46	0	0	78	12	74	0	0	7	0	100	0	50	78	2	7	0	44	0	48	0	0	0	48
<i>Pseudomonas fluorescens 37°C</i>	100	94	5	26	0	0	0	7	0	0	0	0	0	63	0	0	41	0	0	0	0	0	7	0	0	0	74
<i>Burkholderia cepacia</i>	91	100	5	98	0	0	94	0	25	76	0	30	0	95	5	87	87	12	0	0	48	84	95	3	0	5	0
<i>Pseudomonas putida</i>	100	100	0	75	0	0	24	0	56	0	0	5	0	95	0	5	53	0	0	0	0	0	0	1	1	0	95
<i>Pseudomonas stutzeri</i>	100	100	81	48	0	0	18	18	9	0	0	17	0	72	0	3	33	0	0	0	0	0	0	0	0	0	14
<i>Pseudomonas diminuta</i>	100	100	10	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
<i>Burkholderia pseudomallei</i>	100	100	90	12	0	0	95	95	51	0	0	39	0	86	0	75	80	95	80	6	70	70	80	56	6	9	85
<i>Shewanella putrefaciens</i>	100	100	100	80	80	100	0	0	0	0	0	20	0	80	0	80	0	0	0	0	0	0	0	0	0	0	0
<i>Alcaligenes faecalis type 11</i>	91	91	40	26	0	0	0	0	0	0	0	0	0	58	0	0	40	0	0	0	0	0	0	0	0	0	0
<i>Alcaligenes faecalis</i>	100	80	0	36	9	0	0	0	0	0	0	0	0	100	0	0	1	0	0	0	0	0	0	0	0	0	0
<i>Alcaligenes xylosoxidans ss xylos</i>	100	100	100	95	0	0	0	0	0	0	0	0	0	80	0	3	4	0	0	0	0	0	0	0	0	0	0
<i>Flavobacterium meningosepticum</i>	100	5	2	0	0	0	0	0	0	45	100	0	0	27	0	79	0	0	0	0	0	3	5	0	0	0	0
<i>Flavobacterium odoratum</i>	99	3	0	0	0	0	0	0	0	0	0	100	0	60	0	60	0	0	0	0	0	0	0	0	0	0	0
<i>Flavobacterium breve</i>	100	5	1	0	0	0	0	0	0	0	60	2	0	60	0	60	0	0	0	0	0	0	0	0	0	0	0
<i>Flavobacterium oindologenes</i>	100	4	31	0	0	0	0	0	0	0	100	0	0	70	0	100	0	0	0	0	0	0	0	0	0	0	0
<i>Vibrio fluvialis</i>	100	70	96	0	0	0	100	100	0	42	15	0	0	84	0	79	5	0	0	8	100	0	100	0	0	49	98
<i>Vibrio furnissii</i>	100	90	98	0	0	0	100	100	0	35	11	0	0	90	0	80	12	0	0	45	100	0	95	0	5	0	95
<i>Vibrio mimicus</i>	98	100	100	97	92	0	100	80	0	90	94	0	5	90	0	63	0	0	0	0	1	19	1	0	0	0	0
<i>Vibrio vulnificus</i>	99	99	100	98	93	0	100	43	0	75	95	0	0	75	35	79	0	0	0	0	15	86	0	0	0	95	0
<i>Vibrio cholerae</i>	100	0	100	0	0	0	100	0	0	0	38	0	0	0	0	0	0	0	0	0	0	0	94	0	0	0	0
<i>Vibrio parahaemolyticus</i>	100	97	99	98	98	0	100	98	0	93	88	0	65	96	0	43	2	0	0	0	100	9	0	0	0	5	0
<i>Vibrio parahaemolyticus</i>	100	99	100	93	59	0	80	93	10	20	65	0	0	31	0	55	0	0	0	0	0	0	34	0	28	0	0
<i>Vibrio alginolyticus</i>	100	100	100	90	70	0	50	20	0	10	20	0	70	10	0	30	10	0	0	0	60	0	10	0	10	0	0
<i>Vibrio cincinnatiensis</i>	100	86	100	57	0	0	100	100	43	86	8	0	0	21	0	0	0	100	0	0	100	0	100	0	0	100	0
<i>Vibrio damsela</i>	95	25	100	50	0	0	100	0	0	0	0	0	95	0	0	6	0	0	0	0	5	0	93	0	0	0	95
<i>Vibrio carchariae</i>	100	0	100	100	0	0	50	50	0	0	100	0	50	0	0	0	0	0	0	0	50	0	0	0	0	0	0
<i>Moraxella spp.</i>	100	0	65	50	50	0	0	0	0	0	0	9	0	50	0	19	2	0	0	0	0	0	0	0	0	0	0
<i>Plesiomonas shigelloides</i>	97	85	99	95	50	0	100	0	0	94	100	0	0	0	0	5	0	99	0	0	0	40	0	0	0	20	95
<i>Aeromonas hydrophila</i>	100	100	98	72	1	5	100	96	1	93	99	5	76	26	0	83	1	0	1	9	93	27	62	3	3	65	90
<i>Aeromonas veronii bio sobria</i>	100	100	100	91	2	0	100	100	0	88	96	0	80	77	0	60	4	1	0	0	88	5	11	2	2	2	98
<i>Aeromonas veronii bio veronii</i>	100	100	100	91	87	0	100	100	0	88	96	0	80	77	0	60	4	1	0	0	88	5	11	2	2	83	10
<i>Aeromonas caviae</i>	100	100	100	40	0	1	100	97	2	96	92	0	22	3	0	50	0	0	1	22	100	15	84	0	1	33	84
<i>Weeksella virosa</i>	99	0	0	0	0	0	0	0	0	0	60	0	0	0	0	80	0	0	0	0	0	0	0	0	0	0	0
<i>Weeksella zoohelcum</i>	99	0	0	0	0	0	0	0	0	0	20	85	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0
<i>Pasteurella multocida</i>	100	0	45	1	78	0	100	90	34	10	90	3	0	0	0	0	1	5	84	1	88	9	3	0	1	1	1
<i>Pasteurella haemolytica</i>	95	0	95	0	0	0	100	90	40	70	0	0	0	0	0	0	0	70	70	0	90	20	5	10	70	0	0
<i>Actinobacillus spp.</i>	90	0	91	0	0	10	33	27	11	78	0	100	0	0	0	0	5	0	5	0	27	27	0	0	33	33	0

Number denotes the percentage of positive strains

21 COLOUR CHART

Colour chart/Farbtafel/Tableau 'de couleurs													
Microgen GN A ID													
WELL/NAFFCHEN /GODET	1	2	3	4	5	6	7	8	9	10	11	12	7
Reaction	Lysine	Ornithine	H ₂ S	Glucose	Mannitol	Xylose	O.N.P.G.	Indole	Urease	V.P.	Citrate	T.D.A.	Nitrate
Negative													
Positive													

Microgen GN B ID													
WELL/NAFFCHEN /GODET	13	14	15	16	17	18	19	20	21	22	23	24	24
Reaction	Gelatin	Malonate	Inositol	Sorbitol	Rhamnose	Sucrose	Lactose	Arabinose	Adonitol	Raffinose	Salicin	Arginine 24hrs	Arginine 48hrs
Negative													
Positive													

CAUTION: Keep out of direct sunlight. Due to laminate discolouration and paper ageing, the colours on the chart will change.

These colours are provided as general guide to range of test colours.

Legend:

- Appropriate reagents to be added prior to reading.
- Overlaid with sterile mineral oil.
- Not overlaid with oil for Oxidase positive organism.

Microgen GN A+B ID System

Cat. No.: MID64; MID65

V6.0

14 NOV 2024



TECHNICAL SUPPORT SERVICE

For technical assistance and more information please contact Gold Standard Diagnostics Budapest's Customer Service or your local distributor.

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LIST OF MODIFICATIONS		
VERSION	DESCRIPTION OF THE CHANGE	ISSUE DATE
1.0	First issue	01 JUN 2023
2.0	® symbol was removed	09 AUG 2023
3.0	17.1 ; 17.2.1 and 17.2.2 Microorganism lists were completed with new microorganisms name	06 SEP 2023
4.0	No product or assay-specific changes Clarified "Additional materials required" section Adjustment of structuring, formatting in some sections	19 OCT 2023
5.0	Version approved by AOAC Added AOAC licence number and logo on the front page Clarified "Additional materials required" section Updated section 7. PRECAUTIONS Added disclaimer on Storage conditions section "Do not freeze".	09 JAN 2024
6.0	Microgen logo removal	14 NOV 2024