

Comparison study between CHROMagar™ P.aeruginosa and CN agar media according to NF EN ISO 16266: 2008

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This report contains 14 pages and 26 pages of appendices.

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Preamble

- **Reference method used for the comparison:**
 - **NF EN ISO 16266: 2008:** Water quality – Detection and enumeration of *Pseudomonas aeruginosa* – Method by membrane filtration.

- **Application scope of the CHROMagar™ P.aeruginosa:**
 - **Human consumption water samples:**
 - Well and borehole water samples,
 - Bottled water samples,
 - Tap and fountain water samples.

 - **Recreational non-treated water samples:**
 - Sea water samples,
 - Fresh water samples.

 - **Recreational treated water samples:**
 - Swimming pool water samples,
 - Thermal water samples.

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Appendix B: LOD-LOQ – raw results and statistical calculations

Appendix C: Relative accuracy study and statistical calculations

Appendix D: Inclusivity / Exclusivity study – raw results

1. Introduction

The aim of this study is to verify the analytical performance of the new CHROMagar™ *P.aeruginosa* agar medium in comparison to the NF EN ISO 16266:2008 for detection and enumeration of *Pseudomonas aeruginosa* in water.

For this study, 4 stages were carried out: a linearity study, a LOD-LOQ study, a relative accuracy part by analyzing 101 water samples and a selectivity study in parallel with the CHROMagar™ *P.aeruginosa* medium and the EN ISO 16266:2008 method.

For the linearity study, two “water-strain” pairs were tested at 5 different contamination levels in duplicate by the reference and the alternative method in order to obtain at least 3 effective values. One couple of “bottled mineral water / *Pseudomonas aeruginosa* strain “ and one couple of “recreational treated water / *Pseudomonas aeruginosa* strain “ were tested.

For the LOD-LOQ study a pure culture of the target strains were tested in sterile water at 6 different low contamination levels (0, 1, 2, 3, 5 and 10 CFU/100 mL for example). At least 1 level must produce less than 50% of positive results and 1 level must produce more than 50% of positive results.

For the relative accuracy study, 101 water samples divided into three different types (human consumption, recreational treated and non-treated water) were analyzed with the CHROMagar™ *P.aeruginosa* medium and the NF EN ISO 16266:2008 method.

For the inclusivity study, 25 target strains of *Pseudomonas aeruginosa* were tested on CHROMagar™ *P.aeruginosa* medium after 18 and 24 hours of incubation at 36±2°C.

Exclusivity study was conducted on 48 non-target strains. For this study, CHROMagar™ *P.aeruginosa* plates were read only after 24 hours of incubation at 36±2°C.

2. Protocols of the methods

2.1. Alternative method

2.1.1. Protocol of the method

The protocol of the method is the following:

- Filter 100 mL of the water sample or portions of the dilution through a sterile cellulose ester membrane filter with a rated pore diameter equivalent to 0,45 µm. As specified in ISO 8199, place each membrane filter on a Petri dish containing CHROMagar™ P.aeruginosa agar ensuring no air is trapped beneath the membrane.
- Incubate the plate in a 36±2°C incubator during 24 hours.
- Enumerate all typical red colonies on filter for the result. The result is expressed as colony forming units (CFU) per 100 mL. No confirmation is required for this method.

In this study, only one incubation time (24 hours) was tested and interpreted.

2.2. Reference method

The NF EN ISO 16266:2008 standard, Water quality – Detection and enumeration of *Pseudomonas aeruginosa* – Method by membrane filtration.

2.3. Application scope

The alternative method applies to:

- Human consumption water samples (n=38):
 - Well and borehole water samples (100 mL),
 - Bottled water samples (250 mL),
 - Tap and fountain water samples (100 mL).
- Recreational non-treated water samples (n=30):
 - Sea water samples (100 mL),
 - Fresh water samples (100 mL).
- Recreational treated water samples (n=33):
 - Swimming pool water samples (100 mL),
 - Thermal water samples (100 mL).

3. Method comparison study results

3.1. Linearity study

Linearity is the ability of the method when used with a given matrix to give results that are in proportion to the amount of analyte present in the sample, that is an increase in analyte corresponds to a linear or proportional increase in results.

3.1.1. Contamination levels

Two “water-strain” pairs were tested at 5 different contamination levels in duplicate by the reference and the alternative method in order to obtain at least 3 effective values.

The Expert laboratory chose wild strains isolated from naturally contaminated waters to inoculate the water needed for this study.

The two “water samples-strain” pairs are described in Table 1.

Table 1 : combinations « water-strain » and contamination levels

Type of water	Strain	Contamination levels (CFU/mL)	Incubation time
Bottled water	<i>Pseudomonas aeruginosa</i> XXX399	0 – 20 – 40 – 60 – 80	24 h
Swimming pool water	<i>Pseudomonas aeruginosa</i> PVNV55		

3.1.2. Raw results

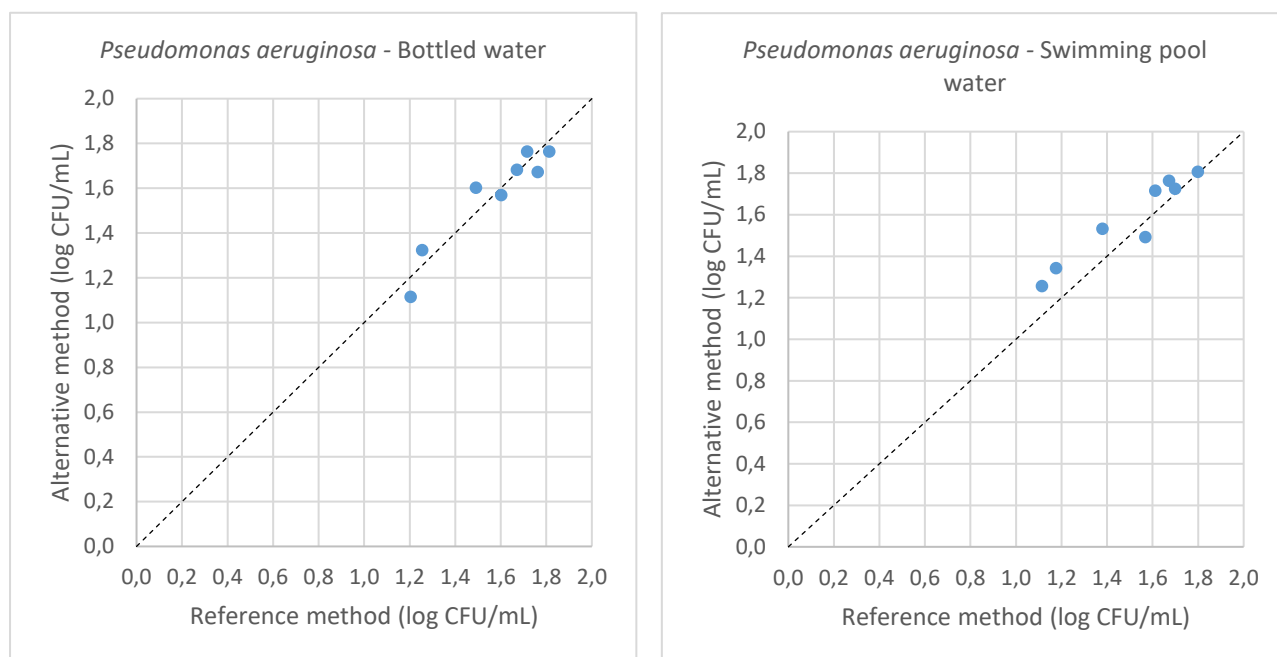
Raw results and statistical calculations are summarized in Appendix A.

Graphs of Figure 1 show the values (log CFU) of each sample obtained by the alternative method and the reference method after 24h incubation at 36±2°C.

The y-axis is reserved for the alternative method and the x-axis for the reference method.

The representation of a line of equation 'y = x' figures dashed on the graphs.

Figure 1: two-dimensional graph for the linearity in bottled water and in swimming pool water after 24h of incubation at 36±2°C



3.1.3. Statistical tests

Statistical interpretations are carried out and presented in Table 2.

The linear regression method is chosen over the value of the robustness of the ratio R of overall repeatability standard deviation:

- If Rob.R > 2, linear regression by least-squares (OLS 1) is used with the x-axis for the reference method,
- if Rob.R < 0.5, a linear regression by least-squares (OLS 2) is used with the x-axis for the alternative method,
- If 0.5 < Rob.R < 2, orthogonal regression (GMFR) is used with the x-axis to the reference method.

Table 2: statistical data of the matrix – strain pairs analyzed

Water	Incubation time	Rob. R	Regression used	F critical	Rob. F	P (Rob.F)	Correlation coefficient (r)	Regression line (y=bx+a)
Bottled water	24 hours	0.228	OLS2	1.482	17.10	0.011	0.987	0.999 log Ref - 0.002
Swimming pool water	24 hours	0.388	OLS2	9.267	2.143	0.233	0.987	0.816 log Ref + 0.352

The relationship between the 2 methods is not linear:

- if $\text{Rob.F} > \text{critical F}$ or,
- if $P(\text{Rob.F}) < \alpha (= 0,05)$.

For bottled water, (24h incubation time) the relationship between the two methods is statistically not linear because $\text{Rob.F} > \text{critical F}$ and $P(\text{Rob.F}) < \alpha (= 0,05)$. However, the correlation coefficient of the regression lines is satisfactory (0.987). The CHROMagar™ *P.aeruginosa* medium presents equivalent cell recovery than the ISO method for bottled water on this linearity step.

For swimming pool water (24h incubation time), the relationship between the two methods is statistically linear because $\text{Rob.F} < \text{critical F}$ and $P(\text{Rob.F}) > \alpha (= 0,05)$. The correlation coefficient between the two methods is very good and similar to bottled water (0.987).

3.1.4. Conclusion

The linearity of the CHROMagar™ *P.aeruginosa* medium is considered satisfactory.

3.2. Detection and quantification limits

The detection and quantification limits are checked, and three parameters are determined.

Here are their definitions:

- the **critical level (LC)** is the smallest amount which can be detected (not null), but not quantified as an exact value. Below this value, it cannot be sure that the true value is not null. At this level, the false negatives probability β is 50 % (β is the second type of statistical error).
- the **detection limit (LOD)** is higher than the critical level, because it involves a power, the probability $1 - \beta$, which has to be well over 50 %, for example 95 %.
- the **quantification limit (LOQ)** is the smallest amount of analyte, (that is the lowest actual number of organisms), which can be measured and quantified with defined precision and accuracy under the experimental conditions by the method under validation.

3.2.1. Protocols

Detection and quantification limits were determined by analyzing with the alternative method after 24h of incubation at $36 \pm 2^\circ\text{C}$ a pure culture of a *Pseudomonas aeruginosa* strain (LHHM99), isolated from a river water, in a sterile tap water.

Ten levels of contamination, with six repetitions for each level, have been studied. Raw results are presented in Table 3.

Table 3: data for the enumeration of *Pseudomonas aeruginosa* in tap water

Target level (CFU/100 mL)	Real level (CFU/100 mL) (a)	Repetition					
		1	2	3	4	5	6
		<i>P.aeruginosa</i> (CFU/100 mL)	<i>P.aeruginosa</i> (CFU/100 mL)	<i>P.aeruginosa</i> (CFU/100 mL)	<i>P.aeruginosa</i> (CFU/100 mL)	<i>P.aeruginosa</i> (CFU/100 mL)	<i>P.aeruginosa</i> (CFU/100 mL)
0,0	0,0	0	0	0	0	0	0
0,5	0,4	0	1	0	0	1	0
0,6	0,5	0	1	1	2	0	3
0,7	0,7	0	0	0	1	1	1
0,8	0,6	1	0	0	0	2	1
1,0	0,8	2	0	2	3	1	1
2,0	2,4	3	2	3	1	0	4
3,0	3,0	1	4	3	1	3	6
5,0	5,4	6	8	5	6	1	5
10,0	11,8	5	15	12	12	19	15

(a): level calculated from 20 enumerations.

3.2.2. Results

Raw results are presented in Appendix B and the summary in the following Table.

Table 4: data (s_0 and x_0) for the enumeration of *Pseudomonas aeruginosa* in tap water

Level (CFU/mL)	Number of positive sample	Standard deviation (s_0)	Bias (x_0)
0	0	0,000	0,0
0,5	2	0,516	0,0
0,6	4	1,169	1,0
0,7	3	0,548	0,5
0,8	4	0,816	0,5
1,0	9	1,049	1,5
2,0	13	1,472	2,5
2,3	18	1,897	3,0
3,8	31	2,317	5,5
5,4	78	4,690	13,5

Two very close levels (0.6 and 0.7) can be used to calculate the limits of detection and quantification. The following table presents the calculations performed for level 0.6 (in blue) and level 0.7 (in orange). For level 0.6, a high standard deviation was observed (1.169), resulting in relatively high limits of detection and quantification. The level 0.7 gave very homogenous results and a low standard deviation (0.548).

3.2.3. Conclusion

The calculated values of the critical level, the detection limit and the quantification limit are presented in Table 5.

Table 5: LC, LOD and LOQ values of the alternative method after 24h of incubation time

	Formulas	Obtained values	Obtained values
Critical level (LC)	$1,65 S_o + X_o$	2,93	1,40
Limit of detection (LOD)	$3,3 S_o + X_o$	4,86	2,31
Limit of quantification (LOQ)	$10 S_o + X_o$	12,69	5,98

The limit of detection and the limit of quantification of the CHROMagar™ P.aeruginosa medium are correct.

3.3. Relative accuracy study

The relative accuracy is the degree of correspondence between the response obtained by the reference method and the response obtained by the alternative method on the same samples.

3.3.1. Number and nature of the water samples tested

Three categories of water were tested with the alternative method and the reference method, including different types of water samples.

Samples analyzed are presented in Table 6.

Table 6: number and nature of the water samples

Category	Type	Analyzed samples	Exploited samples
Human consumption water	Well and borehole water	10	10
	Bottled water	10	10
	Tap and fountain water	20	18
	TOTAL	40	38
Recreational non-treated water	Sea water	15	15
	Fresh water	16	15
	TOTAL	31	30
Recreational treated water	Swimming-pool water	15	15
	Thermal and spa water	15	15
	TOTAL	30	30
All categories		101	98

A total of 101 water samples were analyzed, 98 were exploited. Samples that were not retained in the statistical analysis correspond to samples for which enumerations were inferior to 3 CFU/mL or superior to the limit of detection for at least one of the replicates of the two methods.

Nine percent of the water samples were artificially contaminated. The contamination levels cover the measuring range of the alternative method. For this part of relative accuracy, the characteristic colonies observed on CHROMagar™ P.aeruginosa agar were confirmed by the tests of NF EN ISO 16266:2008.

3.3.2. Raw results

Raw results presented in Appendix C and statistical calculations in Table 7.

Figures 2 to 4 show the two-dimensional graphs for the categories tested, respectively, in CFU/mL for the incubation time tested. The y-axis is reserved for the alternative method and the x- axis for the reference method. The representation of a line of equation “ $y = x$ ” figures dashed on the graphs.

Figure 2: graph after 24 h of incubation at 36 ± 2 °C for human consumption water

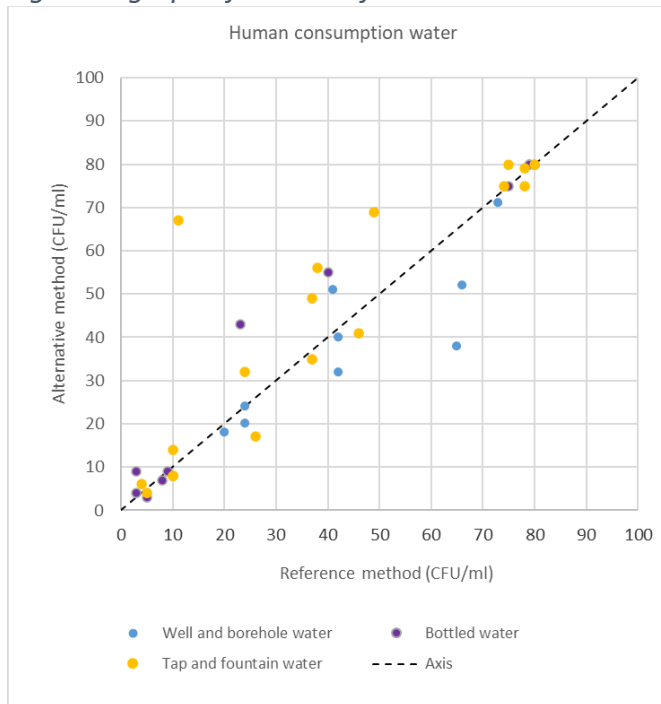


Figure 3: graph after 24h of incubation at 36 ± 2 °C for recreational non-treated water

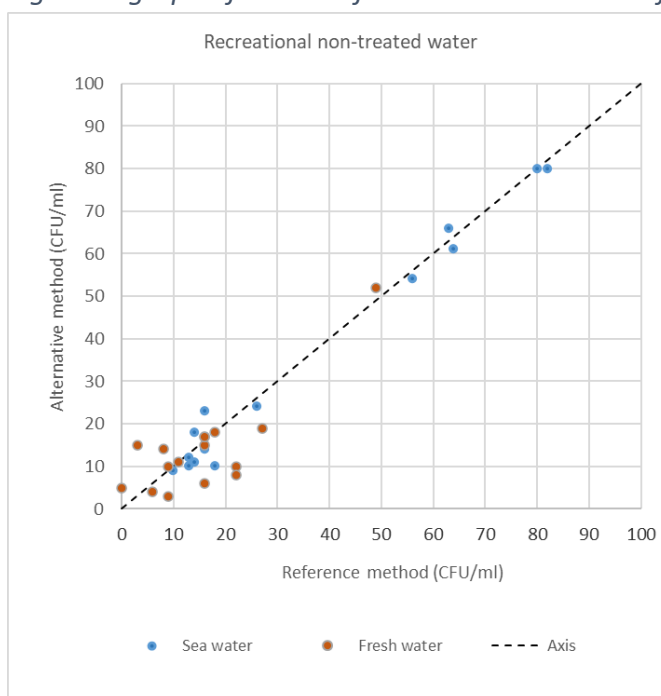
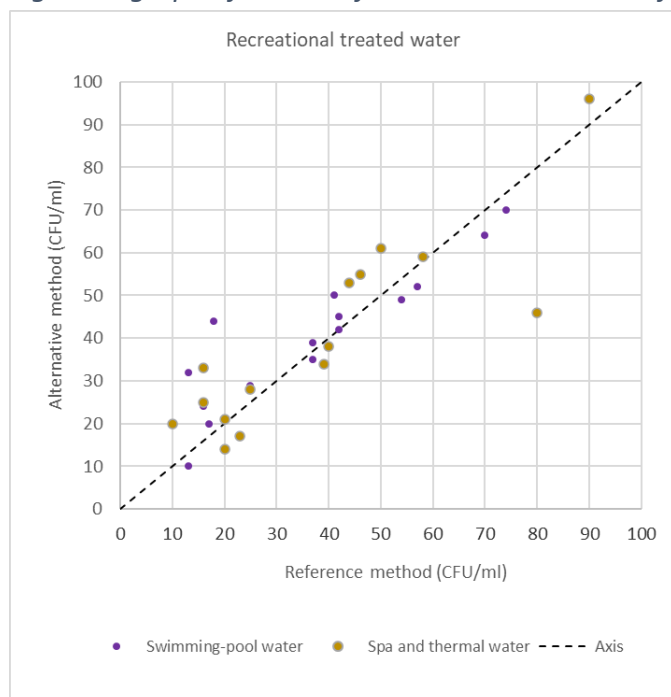


Figure 4: graph after 24h of incubation at 36±2 °C for recreational treated water



3.3.3. Statistical exploitation

The results obtained are analyzed using the Bland-Altman method. Statistical calculations are carried out with exploited samples only.

Table 7 presents the summary of the average differences and standard deviation differences per category and for all categories after 24 hours of incubation at 36±2 °C.

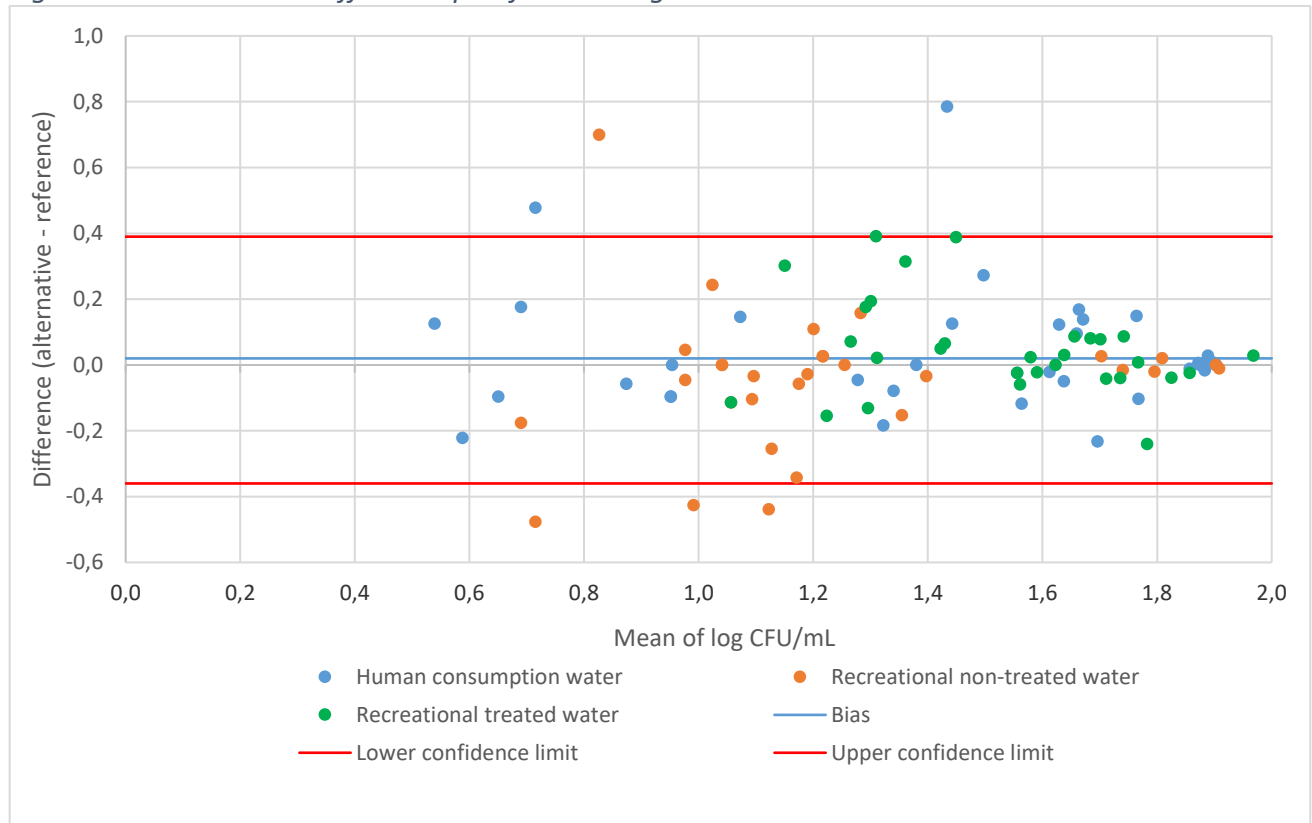
Table 7: values for the Bland-Altman difference plot after 24 hours of incubation at 36±2 °C

Category	n	Bias	Standard deviation differences	Lower Confidence Limit	Upper Confidence Limit
Human consumption water	38	0,04	0,18	/	/
Recreational non-treated water	30	-0,05	0,22	/	/
Recreational treated water	30	0,05	0,15	/	/
All categories	98	0,02	0,19	-0,36	0,39

No significative difference was observed between the CHROMagar™ P.aeruginosa method and the reference method after 24 hours of incubation at 36±2 °C (bias = 0.02).

The Bland-Altman difference plots are presented for all categories in Figure 5 for 24h of incubation at 36 ± 2 °C.

Figure 5: Bland-Altman difference plot for all categories – 24h incubation at 36 ± 2 °C



Samples for which the average difference is lower or higher than the confidence limits are listed in Table 8 .

Table 8: values outside the confidence limits on the Bland-Altman difference plot

Cat.	#	Matrix	RM	AM	RM	AM	Mean	Difference
			CFU/ mL	CFU/ mL	log CFU/mL	log CFU/mL		
Human consumption water	3301321	Bottled water	3	9	0.48	0.95	0.72	0.48
	3301427	Fountain water	11	67	1.04	1.83	1.43	0.78
Recreational non-treated water	3276214	Fresh water	16	6	1.20	0.78	0.99	-0.43
	3276222	Fresh water	22	8	1.34	0.90	1.12	-0.44
	3276223	Fresh water	9	3	0.95	0.48	0.72	-0.48
	3301410	Fresh water	3	15	0.48	1.18	0.83	0.70
Recreational treated water	3301445	Swimming pool water	13	32	1.11	1.51	1.31	0.39

3.3.4. Conclusion

Seven values are outside the calculated confidence limits and concern all categories of water tested. The correlation between the reference method and the alternative method is correct for the incubation time tested.

3.4. Selectivity study

3.4.1. Protocol

- **Inclusivity**

An inclusivity study was conducted on twenty-five target strains of *Pseudomonas aeruginosa*. All the strains were analysed at a level of contamination between 10 and 100 CFU/100 mL by the NF EN ISO 16266:2008 method and CHROMagar™ P.aeruginosa method.

For this study, CHROMagar™ P.aeruginosa plates were read after 18 and 24 hours of incubation.

- **Exclusivity**

An exclusivity study was conducted on forty-eight non-target strains. All the strains were analysed at level of contamination of 10⁵ CFU/mL by the NF EN ISO 16266:2008 method and CHROMagar™ P.aeruginosa method.

For this study, CHROMagar™ P.aeruginosa plates were read after 24 hours of incubation.

3.4.2. Results

Raw results are presented in Appendix D.

- **Inclusivity**

Among the twenty-five strains of *Pseudomonas aeruginosa* tested, all of them gave characteristic colonies on CHROMagar™ P.aeruginosa and on the reference method.

The specificity percentage is therefore 100%.

No difference was observed 18h and 24h of incubation time.

- **Exclusivity**

Among the forty-eight non-target strains tested for the majority of them no growth was observed on the CHROMagar™ P.aeruginosa medium.

For six strains, (*Acinetobacter pittii*, *Pseudomonas fluorescens*, *Pseudomonas fulva*, *Pseudomonas plecoglossicida*, *Pseudomonas putida* and *Pseudomonas rhodesiae*) non-characteristic colony were observed on CHROMagar P. aeruginosa plates (colorless or very light pink colonies).

For one strain (*Aeromonas hydrophila/caviae*) the presence of characteristic colonies was observed on CHROMagar™ P.aeruginosa plates. Biochemical identification demonstrated the presence of the species *Aeromonas*.

The selectivity percentage is therefore 98.0%.

3.5. General conclusion

The linearity study of the CHROMagar™ P.aeruginosa method is satisfactory, with a good correlation with the NF EN ISO 16266:2008 method.

The relative accuracy study also shows a good correlation between the reference method and the CHROMagar™ P.aeruginosa method for the incubation time tested (i.e. 24 hours).

The bias between the two methods is:

- 0.04 CFU/250 mL for the human consumption water category
- -0.05 CFU/100 mL for the recreational non-treated water category
- 0.05 CFU/100 mL for the recreational treated water category
- 0.02 CFU/100 mL for all the water categories.

Resulting in better recovery of *Pseudomonas aeruginosa* colonies with the CHROMagar™ P.aeruginosa method compared to the reference method NF EN ISO 16266:2008.

The limits of detection and the limits of quantification of the CHROMagar™ P.aeruginosa method are correct.

The specificity and selectivity of the CHROMagar™ P.aeruginosa medium are very good.

Le Lion d'Angers, March 4th, 2026
Guillaume MESNARD
Method Validation Supervisor



APPENDICES

APPENDIX A

LINEARITY STUDY

Raw results & statistical calculations

Linearity - raw results - bottled water

Inoculation level (CFU/100mL)	Matrix	Strain	Origin	NF EN ISO 16266:2008				
				Répétition 1 48h	Result 1	Répétition 2 48h	Result 2	Mean
				CFU/250mL	CFU/250mL	CFU/250mL	CFU/250mL	
0	bottled water	<i>Pseudomonas aeruginosa</i> XXX399	River water	0	0	0	0	0
20				16	16	18	18	17
40				40	40	31	31	35,5
60				47	47	58	58	52,5
80				65	65	52	52	58,5

Inoculation level (CFU/100mL)	Matrix	Strain	Origin	CHROMagar P.aeruginosa				
				Repetition 1	Result 1	Repetition 2	Result 2	Mean
				CFU/250mL	CFU/250mL	CFU/250mL	CFU/250mL	
0	bottled water	<i>Pseudomonas aeruginosa</i> XXX399	River water	0	0	0	0	0
20				13	13	21	21	17
40				37	37	40	40	38,5
60				48	48	47	47	47,5
80				58	58	58	58	58

Linearity -bottled water - log data

Level	Reference method				Alternative method			
	Rép.1	Rép.2	M	SD	Rép.1	Rép.2	M	SD
1	1,204	1,255	1,2	0,036	1,114	1,322	1,2	0,147
2	1,602	1,491	1,5	0,078	1,568	1,602	1,6	0,024
3	1,672	1,763	1,7	0,065	1,681	1,672	1,7	0,006
4	1,813	1,716	1,8	0,069	1,763	1,763	1,8	0,000

q =	4	Mx =	1,565	My =	1,561
n =	2	MEDx =	1,632	MEDy =	1,631
N = qn =	8	SDbx =	0,242	SDby =	0,240
		MEDwx =	0,067	MEDwy =	0,015
		SDwx =	0,064	SDwy =	0,053
		rob. SDwx =	0,099	rob. SDwy =	0,023

Choix méthode

OLS2 rob.R<0,5

R = 0,827

rob.R = 0,228

Res.SEM = 0,040

Res.SD = 0,057

Sx = 0,229

Sy = 0,229

r = 0,987

b = 0,999

a = -0,002

Sb = 0,101

Sa = 0,160

p(t;b=1) = 0,993

p(t;a=0) = 0,989

t (b) = 0,009

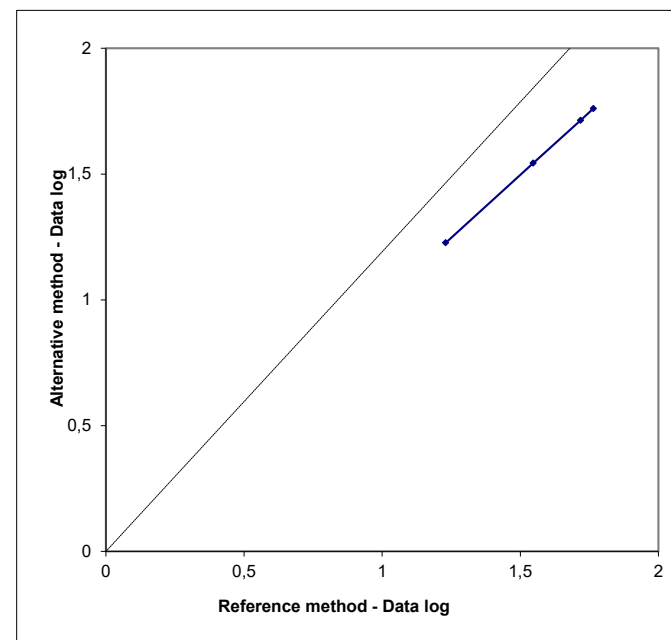
t (a) = 6,275

Est y	Déviation
1,226	-0,008
1,543	0,042
1,714	-0,037
1,760	0,003

Linéarité

F = 1,482
rob.F = 17,107

p(F) = 0,330
rob.p(F) = 0,011



Linearity - raw results - swimming pool water

Inoculation level (CFU/ 100mL)	Matrix	Strain	Origin	NF EN ISO 16266:2008				
				Répétition 1 48h	Result 1	Répétition 2 48h	Result 2	Mean
				CFU/ 100mL	CFU/ 100mL	CFU/ 100mL	CFU/ 100mL	
0	Swimming pool	<i>Pseudomonas aeruginosa</i> PVNV55	Fresh bathing water	0	<1	0	<1	0
20				15	15	13	13	14
40				24	24	37	37	30,5
60				41	41	50	50	45,5
80				63	63	47	47	55

Inoculation level (CFU/ 100mL)	Matrix	Strain	Origin	CHROMagar P. aeruginosa				
				Repetition 1	Result 1	Repetition 2	Result 2	Mean
				CFU/ 100mL	CFU/ 100mL	CFU/ 100mL	CFU/ 100mL	
0	Swimming pool	<i>Pseudomonas aeruginosa</i> PVNV55	Fresh bathing water	0	<1	0	<1	0
20				22	22	18	18	20
40				34	34	31	31	32,5
60				52	52	53	53	52,5
80				64	64	58	58	61

Linearity - swimming-pool water - log data

Level	Reference method				Alternative method			
	Rép.1	Rép.2	M	SD	Rép.1	Rép.2	M	SD
1	1,176	1,114	1,1	0,044	1,342	1,255	1,3	0,062
2	1,380	1,568	1,5	0,133	1,531	1,491	1,5	0,028
3	1,613	1,699	1,7	0,061	1,716	1,724	1,7	0,006
4	1,799	1,672	1,7	0,090	1,806	1,763	1,8	0,030

q =	4	Mx =	1,503	My =	1,579
n =	2	MEDx =	1,565	MEDy =	1,616
N = qn =	8	SDbx =	0,262	SDby =	0,220
		MEDwx =	0,075	MEDwy =	0,029
		SDwx =	0,089	SDwy =	0,026
		rob. SDwx =	0,112	rob. SDwy =	0,043

Choix méthode

OLS2 rob.R<0,5

R = 0,297

rob.R = 0,388

Res.SEM = 0,036

Res.SD = 0,051

Sx = 0,252

Sy = 0,206

r = 0,987

b = 0,816

a = 0,352

Sb = 0,083

Sa = 0,126

p(t;b=1) = 0,068

p(t;a=0) = 0,031

t (b) = 2,220

t (a) = 5,160

Est y	Déviation
1,287	0,012
1,556	-0,044
1,704	0,016
1,769	0,016

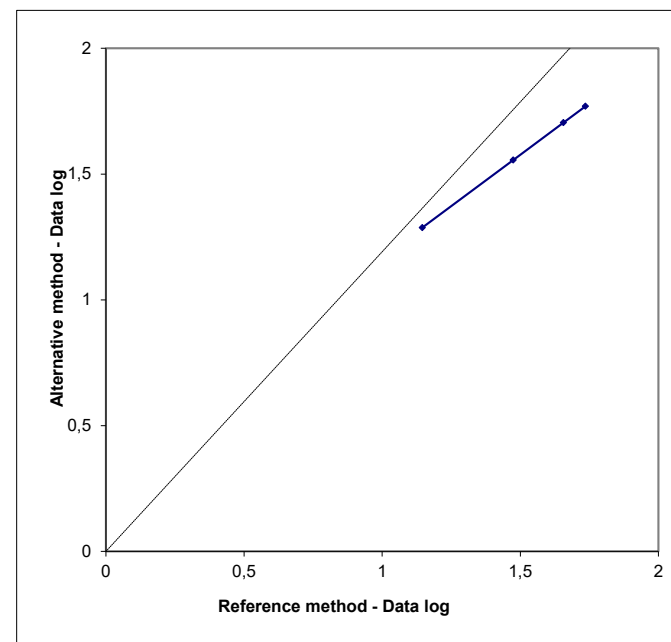
Linéarité

F = 9,267

rob.F = 2,143

p(F) = 0,032

rob.p(F) = 0,233



APPENDIX B

LOD-LOQ

Raw results & statistical calculations

Detection limit (LOD) and Quantification limit (LOQ)

Strain : *Pseudomonas aeruginosa* LHHM99 - Sterile tap water

Target level (CFU/100 mL)	Real level (CFU/100 mL) (a)	Repetition						Ecart-type (So)	Bias (Xo)	Number positive sample
		1	2	3	4	5	6			
		<i>P.aeruginosa</i> (CFU/100 mL)	<i>P.aeruginosa</i> (CFU/100 mL)	<i>P.aeruginosa</i> (CFU/100 mL)	<i>P.aeruginosa</i> (CFU/100 mL)	<i>P.aeruginosa</i> (CFU/100 mL)	<i>P.aeruginosa</i> (CFU/100 mL)			
0,0	0,0	0	0	0	0	0	0	0,000	0,0	0
0,5	0,4	0	1	0	0	1	0	0,516	0,0	2
0,6	0,5	0	1	1	2	0	3	1,169	1,0	4
0,7	0,7	0	0	0	1	1	1	0,548	0,5	3
0,8	0,6	1	0	0	0	2	1	0,816	0,5	4
1,0	0,8	2	0	2	3	1	1	1,049	1,5	9
2,0	2,4	3	2	3	1	0	4	1,472	2,5	13
3,0	3,0	1	4	3	1	3	6	1,897	3,0	18
5,0	5,4	6	8	5	6	1	5	2,317	5,5	31
10,0	11,8	5	15	12	12	19	15	4,690	13,5	78

(a): level calculated from 20 enumerations

Detection limit (**LOD**) and quantification limit (**LOQ**)

Pseudomonas aeruginosa

Level (CFU/mL)	Number of positive sample	Standard deviation (So)	Bias (Xo)
0	0	0,000	0,0
0,5	2	0,516	0,0
0,6	7	1,169	1,0
0,7	3	0,548	0,5
0,8	4	0,816	0,5
1,0	9	1,049	1,5
2,0	13	1,472	2,5
2,3	18	1,897	3,0
3,8	31	2,317	5,5
5,4	78	4,690	13,5

	Formulas	Obtained values	Obtained values
Critical level (LC)	$1,65 S_o + X_o$	2,93	1,40
Limit of detection (LOD)	$3,3 S_o + X_o$	4,86	2,31
Limit of quantification (LOQ)	$10 S_o + X_o$	12,69	5,98

Detection limit (LOD) and Quantification limit (LOQ)

Strain : *Pseudomonas aeruginosa* LHHM99 - Sterile tap water

Target level (CFU/mL)	Real level (CFU/mL) (a)	Repetition																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0,0	0,0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0,5	0,4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2
0,6	0,5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2
0,7	0,7	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	3
0,8	0,6	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2
1,0	0,8	3	3	0	0	1	3	2	0	0	1	1	1	0	0	0	1	0	0	0	0
2,0	2,4	3	4	6	1	3	1	1	2	1	1	1	2	4	1	2	1	6	1	5	2
3,0	3,0	0	6	6	1	5	2	2	4	3	2	7	2	3	2	1	5	1	1	1	6
5,0	5,4	10	5	5	2	4	2	4	6	3	6	5	14	6	5	5	8	6	5	4	3
10,0	11,8	15	11	7	13	11	12	9	11	8	7	11	15	9	11	17	19	15	11	9	15

(a): rate calculated from 20 counts

APPENDIX C

RELATIVE ACCURACY

Raw results & statistical calculations

Relative accuracy - Raw results

Category	#	Matrix	Type of contamination	Injury protocol	Injury measurement	Strain		Taux de contamination (UFC/100 mL)	Reference method - EN ISO 16266:2008*					Alternative method - CHROMagar™ P.aeruginosa				
						Species	#		Dilution	Number of colonies on CN	Number of colonies +	Résult	log	Number of colonies 24H	Number of colonies +	Result at 24h	log	
Human consumption water	a	3281455	Borehole water - Chailland 53	ac	/	/	Ps. aeruginosa	LGDJ99	55	pur	66	5/5+	66	1,8	52	5/5+	52	1,7
	a	3281456	Well water - Cholet 49	nc	/	/	/	/	/	pur	79	5/5+	79	1,9	80	5/5+	80	1,9
	a	3281457	Well water - Peuton 53	ac	/	/	Ps. aeruginosa	LGDJ99	55	pur	42	5/5+	42	1,6	40	5/5+	40	1,6
	a	3281458	Well water - Chanzeau 49	ac	/	/	Ps. aeruginosa	LGDJ99	55	pur	42	5/5+	42	1,6	32	5/5+	32	1,5
	a	3281459	Well water - Longué 49	ac	/	/	Ps. aeruginosa	LGYN77	70	pur	65	5/5+	65	1,8	38	5/5+	38	1,6
	a	3281460	Well water - Beaufort 49	ac	/	/	Ps. aeruginosa	LGYN77	70	pur	41	5/5+	41	1,6	51	5/5+	51	1,7
	a	3281461	Well water - Chalonnes 49	ac	/	/	Ps. aeruginosa	LGYN77	70	pur	24	5/5+	24	1,4	20	5/5+	20	1,3
	a	3281462	Borehole water - Quelaines 53	ac	/	/	Ps. aeruginosa	LGYN77	70	pur	24	5/5+	24	1,4	24	5/5+	24	1,4
	a	3301351	Borehole water - Eole en Beauce 28	cross conta	/	/	Ps. aeruginosa	/	21	pur	20	5/5+	20	1,3	18	5/5+	18	1,3
	a	3301352	Well water - Aviré 49	ac	/	/	Ps. aeruginosa	AS 42	76	pur	73	5/5+	73	1,9	71	5/5+	71	1,9
	b	3301321	Bottled water - Cristalline - Spring water	ac	8' 56°C	0,5	Ps. aeruginosa	YEG730	8	pur	3	3/3+	3	0,5	9	5/5+	9	1,0
	b	3301324	Bottled water - Laqueuille Marque repère- Spring water	ac	4h 2°C	1,1	Ps. aeruginosa	LGGH28	9	pur	8	5/5+	8	0,9	7	5/5+	7	0,8
	b	3301326	Bottled water - Evian - Mineral water	ac	8' 56°C	0,5	Ps. aeruginosa	YEG730	3	pur	3	3/3+	3	0,5	4	4/4+	4	0,6
	b	3301327	Bottled water - Wattwiller - Mineral water	ac	4h 2°C	1,0	Ps. aeruginosa	LHFW28	11	pur	5	5/5+	5	0,7	3	3/3+	3	0,5
	b	3301329	Bottled water - La source des Célestins - Vichy - Spring water	ac	15' 50°C	0,6	Ps. aeruginosa	XXX399	13	pur	9	5/5+	9	1,0	9	5/5+	9	1,0
	b	3301415	Bottled water - Volvic- Mineral water	ac	15' 50°C	1,6	Ps. aeruginosa	XXX399	121	pur	40	5/5+	40	1,6	55	5/5+	55	1,7
	b	3301417	Bottled water - Vittel- Mineral water	ac	4h 2°C	0,5	Ps. aeruginosa	PSE 1.2	110	pur	23	5/5+	23	1,4	43	5/5+	43	1,6
	b	3301435	Bottled water - Mont Blanc- Mineral water	ac	20' 50°C	0,6	Ps. aeruginosa	PSE 1.1	100	pur	80	5/5+	80	1,9	80	5/5+	80	1,9
	b	3301436	Bottled water - Eco + - Spring water	ac	15' 50°C	0,6	Ps. aeruginosa	XXX399	81	pur	75	5/5+	75	1,9	75	5/5+	75	1,9
	b	3301437	Bottled water - Contrexeville - Spring water	ac	20' 50°C	0,6	Ps. aeruginosa	PSE 1.1	100	pur	79	5/5+	79	1,9	80	5/5+	80	1,9
	c	3301334	Tap water - Chartres - 28	ac	15' 50°C	0,6	Ps. aeruginosa	XXX399	13	pur	10	5/5+	10	1	8	5/5+	8	0,9
	c	3301339	Tap water - Saumur - 49	ac	6h 2°C	0,5	Ps. aeruginosa	LHSZ63	11	pur	10	5/5+	10	1,0	8	5/5+	8	0,9
	c	3301421	Tap water - Saintes - 17	ac	4h 2°C	0,5	Ps. aeruginosa	PSE 1.2	110	pur	24	5/5+	24	1,4	32	5/5+	32	1,5
	c	3301422	Tap water - Boufféré -85	ac	4h 2°C	1,0	Ps. aeruginosa	LHFW28	24	pur	37	5/5+	37	1,6	35	5/5+	35	1,5
	c	3301423	Tap water - Le Mans - 72	ac	8' 56°C	0,5	Ps. aeruginosa	YEG730	105	pur	26	5/5+	26	1,4	17	5/5+	17	1,2
	c	3301424	Tap water - Angoulême - 16	ac	8' 56°C	0,5	Ps. aeruginosa	YEG730	105	pur	38	5/5+	38	1,6	56	5/5+	56	1,7
	c	3301425	Tap water - Sablé s/ Sarthe - 72	ac	20' 50°C	0,6	Ps. aeruginosa	PSE 1.1	117	pur	46	5/5+	46	1,7	41	5/5+	41	1,6
	c	3301438	Tap water - Chateaudun- 28	ac	4h 2°C	0,5	Ps. aeruginosa	PSE 1.2	90	pur	74	5/5+	74	1,9	75	5/5+	75	1,9
	d	3301341	Fountain water - Parcé s/ Sarthe -72	ac	4h 2°C	1,1	Ps. aeruginosa	LGGH28	11	pur	5	5/5+	5	0,7	4	4/4+	4	0,6
	d	3301346	Fountain water - Miré - 49	ac	20' 50°C	0,6	Ps. aeruginosa	PSE 1.1	85	pur	78	5/5+	78	1,9	75	5/5+	75	1,9
	d	3301347	Fountain water - Liévin - 59	ac	8' 56°C	0,5	Ps. aeruginosa	YEG730	8	pur	4	4/4+	4	0,6	6	5/5+	6	0,8
	d	3301348	Fountain water - La Baule - 44	ac	6h 2°C	0,5	Ps. aeruginosa	LHSZ63	9	pur	10	5/5+	10	1,0	14	5/5+	14	1,1

Category	#	Matrix	Type of contamination	Injury protocol	Injury measurement	Strain		Taux de contamination (UFC/100 mL)	Reference method - EN ISO 16266:2008*					Alternative method - CHROMagar™ P.aeruginosa				
						Species	#		Dilution	Number of colonies on CN	Number of colonies +	Résult	log	Number of colonies 24H	Number of colonies +	Result at 24h	log	
	d	3301427	Fountain water - Le Lion d'Angers - 49	ac	15' 50°C	0,6	Ps. aeruginosa	XXX399	121	pur	11	5/5+	11	1,0	67	5/5+	67	1,8
	d	3301428	Fountain water - Thivars - 28	ac	8' 56°C	0,5	Ps. aeruginosa	YEG730	105	pur	37	5/5+	37	1,6	49	5/5+	49	1,7
	d	3301430	Fountain water - Escrones - 28	ac	15' 50°C	0,6	Ps. aeruginosa	XXX399	121	pur	49	5/5+	49	1,7	69	5/5+	69	1,8
	d	3301439	Fountain water - Chateaufort s/ Sarthe - 49	ac	20' 50°C	0,6	Ps. aeruginosa	PSE 1.1	100	pur	78	5/5+	78	1,9	79	5/5+	79	1,9
	d	3301440	Fountain water - Saumur - 49	ac	4h 2°C	0,5	Ps. aeruginosa	PSE 1.2	90	pur	80	5/5+	80	1,9	80	5/5+	80	1,9
	d	3301441	Fountain water - Laval - 53	ac	4h 2°C	0,5	Ps. aeruginosa	PSE 1.2	90	pur	75	5/5+	75	1,9	80	5/5+	80	1,9
R e c r e a t i o n a l n o n - t r e a t e d w a t e r s	a	3276230	Sea water - Brétignolles s/ Mer - 85	ac	4h 2°C	1,1	Ps. aeruginosa	LGGH28	9	pur	13	5/5+	13	1,1	10	5/5+	10	1,0
	a	3276231	Sea water - St Hilaire de Riez - 85	ac	4h 2°C	1,1	Ps. aeruginosa	LGGH28	11	pur	13	5/5+	13	1,1	12	5/5+	12	1,1
	a	3276232	Sea water - Les Sables d'Olonne - 85	ac	4h 2°C	1,0	Ps. aeruginosa	LHFW28	10	pur	11	5/5+	11	1,0	11	5/5+	11	1,0
	a	3276234	Sea water - Jard s/ Mer - 85	ac	2h 2°C	0,5	Ps. aeruginosa	LHHM99	26	pur	26	5/5+	26	1,4	24	5/5+	24	1,4
	a	3276235	Sea water - La Bernerie - 44	ac	2h 2°C	0,5	Ps. aeruginosa	LHHM99	12	pur	10	5/5+	10	1,0	9	5/5+	9	1,0
	a	3276237	Sea water - La Rochelle - 17	ac	6h 2°C	0,9	Ps. aeruginosa	PVNV55	10	pur	14	5/5+	14	1,1	11	5/5+	11	1,0
	a	3276238	Sea water - Royan - 17	ac	6h 2°C	0,9	Ps. aeruginosa	PVNV55	14	pur	16	5/5+	16	1,2	14	5/5+	14	1,1
	a	3301353	Sea water - La Brée les Bains - 17	ac	4h 2°C	0,5	Ps. aeruginosa	PSE 1.2	51	pur	82	5/5+	82	1,9	80	5/5+	80	1,9
	a	3301354	Sea water - Le Château d'Oléron - 17	ac	4h 2°C	0,5	Ps. aeruginosa	PSE 1.3	70	pur	64	5/5+	64	1,8	61	5/5+	61	1,8
	a	3301355	Sea water - Vaux s/ Mer - 17	ac	4h 2°C	0,5	Ps. aeruginosa	AS 58	57	pur	18	5/5+	18	1,3	10	5/5+	10	1
	a	3301356	Sea water - St Brévin les Pins - 44	ac	4h 2°C	0,5	Ps. aeruginosa	AS 55	47	pur	56	5/5+	56	1,7	54	5/5+	54	1,7
	a	3301357	Sea water - La Baule - 44	ac	4h 2°C	0,5	Ps. aeruginosa	AS 55	68	pur	63	5/5+	63	1,8	66	5/5+	66	1,8
	a	3301406	Sea water - Saint Malo - 35	cross conta	/	/	Ps. aeruginosa	/	21	pur	16	5/5+	16	1,2	23	5/5+	23	1,4
	a	3301407	Sea water - Lorient - 56	cross conta	/	/	Ps. aeruginosa	/	17	pur	14	5/5+	14	1,1	18	5/5+	18	1,3
	a	3301405	Sea water - Deauville - 14	ac	6h 2°C	0,5	Ps. aeruginosa	LHSZ63	100	pur	80	5/5+	80	1,9	80	5/5+	80	1,9
	b	3276214	Fresh water - Saint Yrieix sur Charente - 16	ac	4h 2°C	1,1	Ps. aeruginosa	LGGH28	9	pur	16	5/5+	16	1,2	6	5/5+	6	0,8
	b	3276215	Fresh water - Malagué - Chaumont en Anjou - 49	ac	4h 2°C	1,1	Ps. aeruginosa	LGGH28	11	pur	16	5/5+	16	1,2	15	5/5+	15	1,2
	b	3276217	Fresh water - Etang St Aubin - Pouancé - 49	ac	4h 2°C	1,0	Ps. aeruginosa	LHFW28	15	pur	16	5/5+	16	1,2	17	5/5+	17	1,2
	b	3276218	Fresh water - Parc St Blaise - Noyant la gravoyère - 49	ac	4h 2°C	1,0	Ps. aeruginosa	LHFW28	30	pur	22	5/5+	22	1,3	10	5/5+	10	1,0
	b	3276221	Fresh water - St Denis du Maine - 49	ac	2h 2°C	0,5	Ps. aeruginosa	LHHM99	26	pur	27	5/5+	27	1,4	19	5/5+	19	1,3
	b	3276222	Fresh water - Parc des Sablières - Ecoflant - 49	ac	2h 2°C	0,5	Ps. aeruginosa	LHHM99	18	pur	22	5/5+	22	1,3	8	5/5+	8	0,9
	b	3276223	Fresh water - Ploermel -56	ac	2h 2°C	0,5	Ps. aeruginosa	LHHM99	13	pur	9	5/5+	9	1,0	3	3/3+	3	0,5
	b	3276226	Fresh water - le Louroux Béconnais - 49	ac	6h 2°C	0,5	Ps. aeruginosa	LHSZ63	20	pur	9	5/5+	9	1,0	10	5/5+	10	1,0
	b	3276227	Fresh water - Châtelleraut - 86	ac	6h 2°C	0,9	Ps. aeruginosa	PVNV55	10	pur	11	5/5+	11	1,0	11	5/5+	11	1,0
	b	3301408	Fresh water - Combrée - 49	ac	4h 2°C	1,0	Ps. aeruginosa	LHFW28	24	pur	16	5/5+	16	1,2	17	5/5+	17	1,2
	b	3301409	Fresh water - Etang de Ribou - Cholet - 49	cross conta	/	/	Ps. aeruginosa	/	21	pur	8	5/5+	8	0,9	14	5/5+	14	1,1
	b	3301410	Fresh water - Villevêque - 49	cross conta	/	/	Ps. aeruginosa	/	17	pur	3	5/5+	3	0,5	15	5/5+	15	1,2
	b	3301414	Fresh water - Rochefort s/ Loire - 49	ac	6h 2°C	0,9	Ps. aeruginosa	PVNV55	6	pur	6	5/5+	6	0,8	4	4/4+	4	0,6
	b	3301411	Fresh water - Coulvé - Chemillé - 49	ac	6h 2°C	0,5	Ps. aeruginosa	LHSZ63	49	pur	18	5/5+	18	1,3	18	5/5+	18	1,3

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						Species	#		Dilution	Number of colonies on CN	Number of colonies +	Résult	log	Number of colonies 24H	Number of colonies +	Result at 24h	log	
	b	3301412	Fresh water - Lac de Maine - Angers - 49	ac	6h 2°C	0,5	Ps. aeruginosa	LHSZ63	49	pur	49	5/5+	49	1,7	52	5/5+	52	1,7
R e c r e a t i o n a l	a	3301358	Swimming pool water - Longué 49 - Chlorine water treatment	cross conta	/	/	Ps. aeruginosa	/	21	pur	17	5/5+	17	1,2	20	5/5+	20	1,3
	a	3301359	Swimming pool water - Villiers Charlemagne 53 - Chlorine water treatment	ac	Chloration 1/100000 2'	0,5	Ps. aeruginosa	CRG930	44	pur	42	5/5+	42	1,6	45	5/5+	45	1,7
	a	3301362	Swimming pool water - St lambert du Lattay 49 - Chlorine water treatment	ac	20' 50°C	0,5	Ps. aeruginosa	MTC349	76	pur	74	5/5+	74	1,9	70	5/5+	70	1,8
	a	3301363	Swimming pool water - Aviré - Chlorine water treatment	cross conta	/	/	Ps. aeruginosa	/	17	pur	13	5/5+	13	1,1	10	5/5+	10	1,0
	a	3301364	Swimming pool water - Peuton 53 -Salt water treatment	ac	Chloration 1/100000 2'	0,5	Ps. aeruginosa	CRG930	44	pur	54	5/5+	54	1,7	49	5/5+	49	1,7
	a	3301365	Swimming pool water - Segré 49 - Chlorine water treatment	ac	Chloration 1/100000 2'	0,5	Ps. aeruginosa	CRG930	44	pur	42	5/5+	42	1,6	42	5/5+	42	1,6
	a	3301366	Swimming pool water - Château Gontier 53 - Chlorine water treatment	ac	10' 56°C	0,5	Ps. aeruginosa	XZK036	69	pur	18	5/5+	18	1,3	44	5/5+	44	1,6
	a	3301442	Swimming pool water - Cholet 49 - Salt water treatment	ac	10' 56°C	0,5	Ps. aeruginosa	XZK036	52	pur	57	5/5+	57	1,8	52	5/5+	52	1,7
	a	3301444	Swimming pool water - Montguillon 49 - Chlorine water treatment	ac	10' 56°C	0,5	Ps. aeruginosa	XZK036	52	pur	41	5/5+	41	1,6	50	5/5+	50	1,7
	a	3301445	Swimming pool water - Loigné 53 - Chlorine water treatment	ac	20' 50°C	0,5	Ps. aeruginosa	MTC349	26	pur	13	5/5+	13	1,1	32	5/5+	32	1,5
	a	3301446	Swimming pool water - Angers 49 - Chlorine water treatment	ac	20' 50°C	0,5	Ps. aeruginosa	MTC349	26	pur	16	5/5+	16	1,2	24	5/5+	24	1,4
	a	3301447	Swimming pool water - Laval 53 - Chlorine water treatment	ac	20' 50°C	0,5	Ps. aeruginosa	LKDR72	32	pur	25	5/5+	25	1,4	29	5/5+	29	1,5
	a	3301448	Swimming pool water - Nyoiseau 49- Chlorine water treatment	ac	20' 50°C	1,5	Ps. aeruginosa	LKDR72	32	pur	37	5/5+	37	1,6	39	5/5+	39	1,6
	a	3301449	Swimming pool water - Ménil 53 - Chlorine water treatment	ac	20' 50°C	0,5	Ps. aeruginosa	LKDR72	32	pur	37	5/5+	37	1,6	35	5/5+	35	1,5
	a	3301450	Swimming pool water - Mayenne 53 -Salt water treatment	ac	20' 50°C	0,6	Ps. aeruginosa	PSE 1.1	100	pur	70	5/5+	70	1,8	64	5/5+	64	1,8
t r e a t e d	b	3301367	Spa water - St Lambert du Lattay 49 - Bromine water treatment	cross conta	/	/	Ps. aeruginosa	/	21	pur	20	5/5+	20	1,3	21	5/5+	21	1,3
	b	3301368	Spa water - Louvaines 49 - Bromine water treatment	ac	20' 50°C	0,5	Ps. aeruginosa	MTC349	96	pur	90	5/5+	90	2,0	96	5/5+	96	2,0
	b	3301369	Spa water - Segré 49 - Bromine water treatment	ac	20' 50°C	0,5	Ps. aeruginosa	MTC349	96	pur	80	5/5+	80	1,9	46	5/5+	46	1,7
	b	3301371	Spa water - Angers 49 - Bromine water treatment	ac	Chloration 1/100000 2'	0,5	Ps. aeruginosa	CRG930	44	pur	44	5/5+	44	1,6	53	5/5+	53	1,7
	b	3301372	Thermal water - Aulus les Bains 09	ac	Chloration 1/100000 2'	0,5	Ps. aeruginosa	CRG930	44	pur	46	5/5+	46	1,7	55	5/5+	55	1,7
	b	3301373	Spa water - Cholet 49 - Bromine water treatment	ac	Chloration 1/100000 2'	0,5	Ps. aeruginosa	CRG930	64	pur	58	5/5+	58	1,8	59	5/5+	59	1,8
	b	3301374	Thermal water - Luchon 31	cross conta	/	/	Ps. aeruginosa	/	21	pur	20	5/5+	20	1,3	14	5/5+	14	1,1
	b	3233870	Thermal water - Contrexeville	ac	10' 56°C	0,5	Ps. aeruginosa	XZK036	45	pur	25	5/5+	25	1,4	28	5/5+	28	1,4
	b	3233871	Thermal water - Avène les Bains	ac	20' 50°C	0,5	Ps. aeruginosa	MTC349	66	pur	50	5/5+	50	1,7	61	5/5+	61	1,8
	b	3233872	Thermal water - Uriage les Bains	ac	20' 50°C	0,5	Ps. aeruginosa	LKDR72	41	pur	40	5/5+	40	1,6	38	5/5+	38	1,6
	b	3233873	Thermal water - La Roche Posay	ac	20' 50°C	0,5	Ps. aeruginosa	LKDR72	41	pur	16	5/5+	16	1,2	33	5/5+	33	1,5
	b	3233874	Thermal water - Jonzac	ac	20' 50°C	0,5	Ps. aeruginosa	LKDR72	41	pur	39	5/5+	39	1,6	34	5/5+	34	1,5
	b	3274972	Thermal water - Vittel	ac	10' 56°C	0,5	Ps. aeruginosa	XZK036	45	pur	16	5/5+	16	1,2	25	5/5+	25	1,4
	b	3274973	Thermal water - Amnéville les bains	ac	20' 50°C	0,5	Ps. aeruginosa	PSE 1.3	26	pur	10	5/5+	10	1,0	20	5/5+	20	1,3
	b	3274974	Thermal water - Evian les Bains	ac	20' 50°C	0,5	Ps. aeruginosa	PSE 1.3	26	pur	23	5/5+	23	1,4	17	5/5+	17	1,2
Non-exploited samples																		
c	3301337	Tap water - Vihiers - 49	ac	2h 2°C	0,5	Ps. aeruginosa	LHHM99	9	pur	1	1/1+	1	0,0	5	5/5+	5	0,7	
c	3301420	Tap water - Médéac - 35	ac	20' 50°C	0,6	Ps. aeruginosa	PSE 1.1	117	pur	0	/	0	/	1	1/1+	1	0,0	
b	3301413	Fresh water - Vichy - 03	ac	6h 2°C	0,9	Ps. aeruginosa	PVNV55	6	pur	0	/	0	/	5	5/5+	5	0,7	

24 hours

Category	Type	#	RM	AM	RM	AM	Mean	Difference
			CFU/mL	CFU/mL	CFU/mL	CFU/mL		
Human consumption water	a	3281455	66	52	1,82	1,72	1,77	-0,10
	a	3281456	79	80	1,90	1,90	1,90	0,01
	a	3281457	42	40	1,62	1,60	1,61	-0,02
	a	3281458	42	32	1,62	1,51	1,56	-0,12
	a	3281459	65	38	1,81	1,58	1,70	-0,23
	a	3281460	41	51	1,61	1,71	1,66	0,09
	a	3281461	24	20	1,38	1,30	1,34	-0,08
	a	3281462	24	24	1,38	1,38	1,38	0,00
	a	3301351	20	18	1,30	1,26	1,28	-0,05
	a	3301352	73	71	1,86	1,85	1,86	-0,01
	b	3301321	3	9	0,48	0,95	0,72	0,48
	b	3301324	8	7	0,90	0,85	0,87	-0,06
	b	3301326	3	4	0,48	0,60	0,54	0,12
	b	3301327	5	3	0,70	0,48	0,59	-0,22
	b	3301329	9	9	0,95	0,95	0,95	0,00
	b	3301415	40	55	1,60	1,74	1,67	0,14
	b	3301417	23	43	1,36	1,63	1,50	0,27
	b	3301435	80	80	1,90	1,90	1,90	0,00
	b	3301436	75	75	1,88	1,88	1,88	0,00
	b	3301437	79	80	1,90	1,90	1,90	0,01
	c	3301334	10	8	1,00	0,90	0,95	-0,10
	c	3301339	10	8	1,00	0,90	0,95	-0,10
	c	3301421	24	32	1,38	1,51	1,44	0,12
	c	3301422	37	35	1,57	1,54	1,56	-0,02
	c	3301423	26	17	1,41	1,23	1,32	-0,18
	c	3301424	38	56	1,58	1,75	1,66	0,17
	c	3301425	46	41	1,66	1,61	1,64	-0,05
	c	3301438	74	75	1,87	1,88	1,87	0,01
	d	3301341	5	4	0,70	0,60	0,65	-0,10
	d	3301346	78	75	1,89	1,88	1,88	-0,02
	d	3301347	4	6	0,60	0,78	0,69	0,18
	d	3301348	10	14	1,00	1,15	1,07	0,15
	d	3301427	11	67	1,04	1,83	1,43	0,78
	d	3301428	37	49	1,57	1,69	1,63	0,12
	d	3301430	49	69	1,69	1,84	1,76	0,15
	d	3301439	78	79	1,89	1,90	1,89	0,01
	d	3301440	80	80	1,90	1,90	1,90	0,00
	d	3301441	75	80	1,88	1,90	1,89	0,03
	Average difference of the category							0,04
	Standard deviation of differences							0,18
Recreational non-treated water	a	3276230	13	10	1,11	1,00	1,06	-0,11
	a	3276231	13	12	1,11	1,08	1,10	-0,03
	a	3276232	11	11	1,04	1,04	1,04	0,00
	a	3276234	26	24	1,41	1,38	1,40	-0,03
	a	3276235	10	9	1,00	0,95	0,98	-0,05
	a	3276237	14	11	1,15	1,04	1,09	-0,10
	a	3276238	16	14	1,20	1,15	1,18	-0,06
	a	3301353	82	80	1,91	1,90	1,91	-0,01
	a	3301354	64	61	1,81	1,79	1,80	-0,02
	a	3301355	18	10	1,26	1,00	1,13	-0,26
	a	3301356	56	54	1,75	1,73	1,74	-0,02
	a	3301357	63	66	1,80	1,82	1,81	0,02
	a	3301406	16	23	1,20	1,36	1,28	0,16
	a	3301407	14	18	1,15	1,26	1,20	0,11
	a	3301405	80	80	1,90	1,90	1,90	0,00
	b	3276214	16	6	1,20	0,78	0,99	-0,43
	b	3276215	16	15	1,20	1,18	1,19	-0,03
	b	3276217	16	17	1,20	1,23	1,22	0,03
	b	3276218	22	10	1,34	1,00	1,17	-0,34
	b	3276221	27	19	1,43	1,28	1,36	-0,15
	b	3276222	22	8	1,34	0,90	1,12	-0,44
	b	3276223	9	3	0,95	0,48	0,72	-0,48

	b	3276226	9	10	0,95	1,00	0,98	0,05	23	
	b	3276227	11	11	1,04	1,04	1,04	0,00	24	
	b	3301408	16	17	1,20	1,23	1,22	0,03	25	
	b	3301409	8	14	0,90	1,15	1,02	0,24	26	
	b	3301410	3	15	0,48	1,18	0,83	0,70	27	
	b	3301414	6	4	0,78	0,60	0,69	-0,18	28	
	b	3301411	18	18	1,26	1,26	1,26	0,00	29	
	b	3301412	49	52	1,69	1,72	1,70	0,03	30	
		Average difference of the category							-0,05	
		Standard deviation of differences							0,22	
Recreational treated water	a	3301358	17	20	1,23	1,30	1,27	0,07	1	
	a	3301359	42	45	1,62	1,65	1,64	0,03	2	
	a	3301362	74	70	1,87	1,85	1,86	-0,02	3	
	a	3301363	13	10	1,11	1,00	1,06	-0,11	4	
	a	3301364	54	49	1,73	1,69	1,71	-0,04	5	
	a	3301365	42	42	1,62	1,62	1,62	0,00	6	
	a	3301366	18	44	1,26	1,64	1,45	0,39	7	
	a	3301442	57	52	1,76	1,72	1,74	-0,04	8	
	a	3301444	41	50	1,61	1,70	1,66	0,09	9	
	a	3301445	13	32	1,11	1,51	1,31	0,39	10	
	a	3301446	16	24	1,20	1,38	1,29	0,18	11	
	a	3301447	25	29	1,40	1,46	1,43	0,06	12	
	a	3301448	37	39	1,57	1,59	1,58	0,02	13	
	a	3301449	37	35	1,57	1,54	1,56	-0,02	14	
	a	3301450	70	64	1,85	1,81	1,83	-0,04	15	
	b	3301367	20	21	1,30	1,32	1,31	0,02	16	
	b	3301368	90	96	1,95	1,98	1,97	0,03	17	
	b	3301369	80	46	1,90	1,66	1,78	-0,24	18	
	b	3301371	44	53	1,64	1,72	1,68	0,08	19	
	b	3301372	46	55	1,66	1,74	1,70	0,08	20	
	b	3301373	58	59	1,76	1,77	1,77	0,01	21	
	b	3301374	20	14	1,30	1,15	1,22	-0,15	22	
	b	3233870	25	28	1,40	1,45	1,42	0,05	23	
	b	3233871	50	61	1,70	1,79	1,74	0,09	24	
	b	3233872	40	38	1,60	1,58	1,59	-0,02	25	
	b	3233873	16	33	1,20	1,52	1,36	0,31	26	
	b	3233874	39	34	1,59	1,53	1,56	-0,06	27	
	b	3274972	16	25	1,20	1,40	1,30	0,19	28	
	b	3274973	10	20	1,00	1,30	1,15	0,30	29	
	b	3274974	23	17	1,36	1,23	1,30	-0,13	30	
		Average difference of the category							0,05	
		Standard deviation of differences							0,15	
	Average difference all categories								0,02	98
	Standard deviation of differences								0,19	

n =	98		
$\beta =$	95%	Lower confidence limit	Upper confidence limit
$T(0.025;98)=$	1,984723186	-0,36	0,39

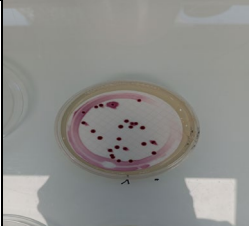
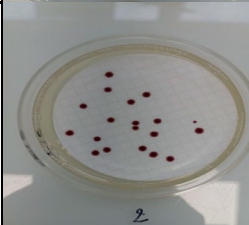
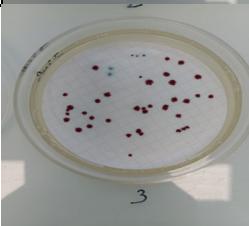
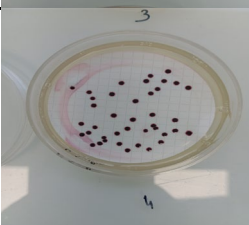
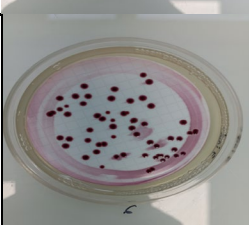
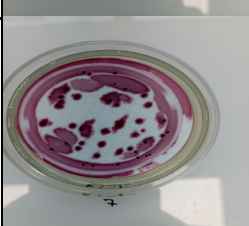
APPENDIX D

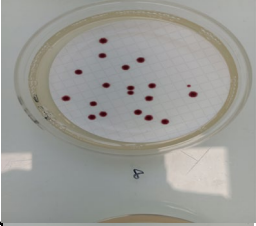
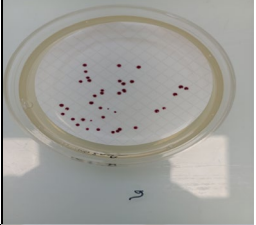
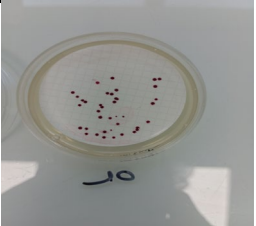
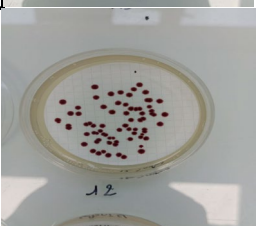
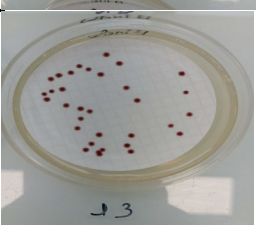
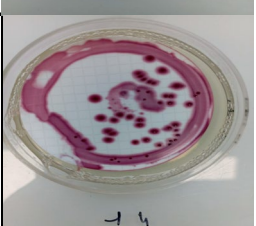
Inclusivity – exclusivity study

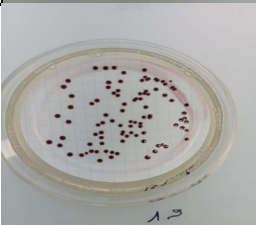
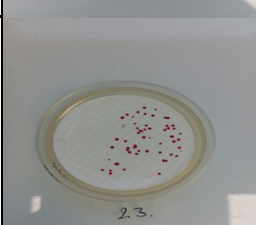
Raw results

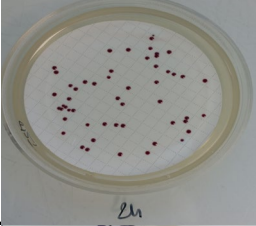
Inclusivity study - raw results

#	Strain	Reference	Origin	Inoculation level (UFC/100 mL s/ TSA)	Reference method - EN ISO 16266:2008*				Alternative method - CHROMagar™ <i>P.aeruginosa</i>							
					Number of colonies on CN	Number of colonies +	Appearance of the colonies	Result	Number of colonies 18H	Number of colonies 18H +	Appearance of the colonies	Result at 18h	Number of colonies 24H	Number of colonies 24H +	Appearance of the colonies	Result at 24h
1	<i>Pseudomonas aeruginosa</i>	YEG730	River water	34	34	34	Blue green	34	25	5/5 +	Brown with diffusion	25	25	5/5 +	Brown with diffusion	25
2	<i>Pseudomonas aeruginosa</i>	XXX399	River water	32	19	19	Blue green	19	19	5/5 +	Brown	19	19	5/5 +	Brown	19
3	<i>Pseudomonas aeruginosa</i>	XZK036	Treated wastewater	35	28	28	Blue green	28	40	5/5 +	Brown	40	40	5/5 +	Brown	40
4	<i>Pseudomonas aeruginosa</i>	CRG930	Outlet water from treatment plant	36	37	37	Blue green	37	38	5/5 +	Brown	38	38	5/5 +	Brown	38
5	<i>Pseudomonas aeruginosa</i>	MTC349	River water	70	61	61	Blue green	61	74	5/5 +	Brown with diffusion	74	74	5/5 +	Brown with diffusion	74
6	<i>Pseudomonas aeruginosa</i>	LGDJ99	Pond water	86	60	60	Blue green	60	80	5/5 +	Brown	80	80	5/5 +	Brown	80
7	<i>Pseudomonas aeruginosa</i>	LGGH28	River water	49	20	20	Blue green	20	50	5/5 +	Brown	50	50	5/5 +	Brown	50
8	<i>Pseudomonas aeruginosa</i>	LHFW28	Pond water	40	32	32	Blue green	32	39	5/5 +	Brown with diffusion	39	39	5/5 +	Brown with diffusion	39
9	<i>Pseudomonas aeruginosa</i>	LHHM99	River water	20	11	11	Blue green	11	19	5/5 +	Brown	19	19	5/5 +	Brown	19
10	<i>Pseudomonas aeruginosa</i>	LHS263	River water	37	15	15	Blue green	15	37	5/5 +	Brown	37	37	5/5 +	Brown	37
11	<i>Pseudomonas aeruginosa</i>	LKDR72	Water from water collector	47	41	41	Blue green	41	41	5/5 +	Brown with diffusion	41	41	5/5 +	Brown with diffusion	41
12	<i>Pseudomonas aeruginosa</i>	LGYN77	Well water	63	60	60	Blue green	60	60	5/5 +	Brown	60	60	5/5 +	Brown	60
13	<i>Pseudomonas aeruginosa</i>	PVMV55	Fresh bathing water	29	28	28	Colorless Fluorescence	28	32	5/5 +	Brown	32	32	5/5 +	Brown	32
14	<i>Pseudomonas aeruginosa</i>	LHDM42	Watercourse	45	37	37	Blue green	37	46	5/5 +	Burgundy color with diffusion	46	46	5/5 +	Burgundy color with diffusion	46
15	<i>Pseudomonas aeruginosa</i>	PSE.1.1	Collection strain	55	30	30	Blue green	30	52	5/5 +	Brown	52	52	5/5 +	Brown	52
16	<i>Pseudomonas aeruginosa</i>	PSE.1.2	Collection strain	64	41	41	Blue green	41	65	5/5 +	Brown	65	65	5/5 +	Brown	65
17	<i>Pseudomonas aeruginosa</i>	PSE.1.3	Collection strain	73	80	80	Colorless Fluorescence	80	74	5/5 +	Pink color with diffusion	74	74	5/5 +	Pink color with diffusion	74
18	<i>Pseudomonas aeruginosa</i>	AS.42	Wild strain	43	28	28	Colorless Fluorescence	28	43	5/5 +	Brown	43	43	5/5 +	Brown	43
19	<i>Pseudomonas aeruginosa</i>	AS.54	Wild strain	78	74	74	Blue green	74	80	5/5 +	Brown	80	80	5/5 +	Brown	80
20	<i>Pseudomonas aeruginosa</i>	AS.55	Wild strain	63	51	51	Blue green	51	66	5/5 +	Brown with diffusion	66	66	5/5 +	Brown with diffusion	66
21	<i>Pseudomonas aeruginosa</i>	AS.58	Wild strain	67	61	61	Blue green	61	66	5/5 +	Brown	66	66	5/5 +	Brown	66
22	<i>Pseudomonas aeruginosa</i>	MYRU55	Collection strain CIP A22	56	57	57	Blue green	57	51	5/5 +	Brown	51	51	5/5 +	Brown	51
23	<i>Pseudomonas aeruginosa</i>	MYTL45	Process water	54	9	9	Colorless but with a green halo present for each colony under the membrane Fluorescence Acétamide 5/5+	9	54	5/5 +	Brown	54	54	5/5 +	Brown	54
24	<i>Pseudomonas aeruginosa</i>	MZTJ95	Process water	55	42	42	Blue green	42	50	5/5 +	Brown	50	50	5/5 +	Brown	50
25	<i>Pseudomonas aeruginosa</i>	MZYQ52	Well water	87	56	56	Blue green	56	80	5/5 +	Brown with diffusion	80	80	5/5 +	Brown with diffusion	80

#	Strain	Code strain	CHROMagar™ P.aeruginosa at 24h
1	<i>Pseudomonas aeruginosa</i>	YEG730	
2	<i>Pseudomonas aeruginosa</i>	XXX399	
3	<i>Pseudomonas aeruginosa</i>	XZK036	
4	<i>Pseudomonas aeruginosa</i>	CRG930	
5	<i>Pseudomonas aeruginosa</i>	MTC349	
6	<i>Pseudomonas aeruginosa</i>	LGDJ99	
7	<i>Pseudomonas aeruginosa</i>	LGGH28	

#	Strain	Code strain	CHROMagar™ P.aeruginosa at 24h
8	<i>Pseudomonas aeruginosa</i>	LHFW28	
9	<i>Pseudomonas aeruginosa</i>	LHBM99	
10	<i>Pseudomonas aeruginosa</i>	LHSZ63	
11	<i>Pseudomonas aeruginosa</i>	LKDR72	
12	<i>Pseudomonas aeruginosa</i>	LGYN77	
13	<i>Pseudomonas aeruginosa</i>	PVNV55	
14	<i>Pseudomonas aeruginosa</i>	LHDM42	
15	<i>Pseudomonas aeruginosa</i>	PSE.1.1	

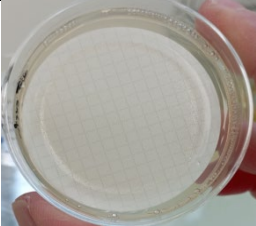
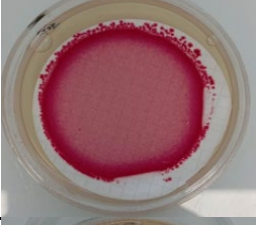
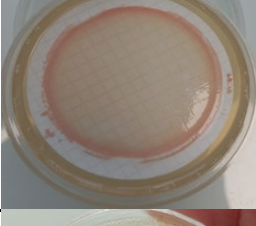
#	Strain	Code strain	CHROMagar™ P.aeruginosa at 24h
16	<i>Pseudomonas aeruginosa</i>	PSE.1.2	
17	<i>Pseudomonas aeruginosa</i>	PSE.1.3	
18	<i>Pseudomonas aeruginosa</i>	AS.42	
19	<i>Pseudomonas aeruginosa</i>	AS.54	
20	<i>Pseudomonas aeruginosa</i>	AS.55	
21	<i>Pseudomonas aeruginosa</i>	AS.58	
22	<i>Pseudomonas aeruginosa</i>	MYRU55	
23	<i>Pseudomonas aeruginosa</i>	MYTL45	

#	Strain	Code strain	CHROMagar™ P.aeruginosa at 24h
24	<i>Pseudomonas aeruginosa</i>	MZTJ95	
25	<i>Pseudomonas aeruginosa</i>	MZYQ52	

Exclusivity study - raw results

#	Strain	Reference	Origin	Inoculation level (UFC/100 mL)/ TSA	Reference method - EN ISO 16266:2008*				Alternative method - CHROMagar™ P.aeruginosa			
					Number of colonies on CN	Number of colonies +	Appearance of the colonies	Result	Number of colonies 24H	Number of colonies 24H +	Appearance of the colonies	Result at 24h
1	<i>Acinetobacter baumannii</i>	SRR958	Well water	4,40E+05	0	/	/	<1	0	/	/	<1
2	<i>Acinetobacter iwoffii</i>	SNL841	Pond water	1,50E+05	3	0	Cream	<1	0	/	/	<1
3	<i>Acinetobacter johnsonii</i>	NXA166	Borehole water	9,90E+05	0	/	/	<1	0	/	/	<1
4	<i>Acinetobacter pittii</i>	LPAL23	Thermal water	4,30E+05	14	0	Colorless	<1	>80	0 IB: <i>Acinetobacter</i>	Colorless	<1
5	<i>Aeromonas hydrophila/caviae</i>	DTH704	Bathing sea water	3,20E+05	>80	0	Colorless	<1	>80	0 IB: <i>Aeromonas</i>	Burgundy red	<1
6	<i>Aeromonas sp</i>	CSNW78	Borehole water	1,10E+05	0	/	/	<1	0	/	/	<1
7	<i>Aeromonas veronii</i>	DVD238	Fresh bathing water	1,00E+05	0	/	/	<1	0	/	/	<1
8	<i>Blastomonas sp</i>	NFF409	Mains water	3,40E+05	0	/	/	<1	0	/	/	<1
9	<i>Cupriavidus necator</i>	CTJL42	Borehole water	2,90E+05	0	/	/	<1	0	/	/	<1
10	<i>Enterobacter asburiae</i>	DNX652	Outlet water from treatment plant	4,00E+05	0	/	/	<1	0	/	/	<1
11	<i>Enterobacter cloacae</i>	QGB538	Pond water	8,40E+03	0	/	/	<1	0	/	/	<1
12	<i>Enterobacter mori</i>	JUD862	Mains water	6,00E+05	31	0	Colorless No fluorescence	<1	0	/	/	<1
13	<i>Enterococcus casseliflavus</i>	NUQ351	Mains water	3,90E+05	0	/	/	<1	0	/	/	<1
14	<i>Enterococcus durans</i>	RSU238	River water	5,50E+05	0	/	/	<1	0	/	/	<1
15	<i>Enterococcus faecalis</i>	NZT069	River water	1,60E+06	0	/	/	<1	0	/	/	<1
16	<i>Enterococcus faecium</i>	DGT553	Pond water	1,80E+05	0	/	/	<1	0	/	/	<1
17	<i>Escherichia coli</i>	YMJ695	Mains water	1,10E+06	>80	0	Cream	<1	0	/	/	<1
18	<i>Hafnia alvei</i>	SRZ676	Mains water	1,70E+05	0	/	/	<1	0	/	/	<1
19	<i>Herbospirillum huttiense subsp putei</i>	JZPH92	Industrial water	3,20E+05	0	/	/	<1	0	/	/	<1
20	<i>Klebsiella oxytoca</i>	CRR504	Outlet water from treatment plant	2,40E+05	0	/	/	<1	0	/	/	<1
21	<i>Klebsiella pneumoniae</i>	RZL454	Pool water	3,40E+05	0	/	/	<1	0	/	/	<1
22	<i>Kluyvera intermedia</i>	SKV203	Outlet water from treatment plant	4,90E+05	0	/	/	<1	0	/	/	<1
23	<i>Lactococcus lactis ssp lactis</i>	DSP656	Bathing sea water	7,00E+05	0	/	/	<1	0	/	/	<1
24	<i>Lelliottia amnigena</i>	XVH427	Borehole water	2,50E+05	0	/	/	<1	0	/	/	<1
25	<i>Lysinibacillus sp</i>	DVF369	Mains water	2,30E+05	0	/	/	<1	0	/	/	<1
26	<i>Micrococcus luteus</i>	NBV721	Sea basin water	5,20E+05	0	/	/	<1	0	/	/	<1
27	<i>Pantoea agglomerans</i>	NWR779	Well water	3,00E+05	0	/	/	<1	0	/	/	<1
28	<i>Proteus mirabilis</i>	STH215	Outlet water from treatment plant	1,50E+05	>80	0	Light yellow No fluorescence	<1	0	/	/	<1
29	<i>Pseudacidovorax sp</i>	NZE254	Well water	2,00E+05	0	/	/	<1	1	/	/	<1
30	<i>Pseudomonas fluorescens</i>	DQR669	Pool water	6,00E+05	>80	0	Colorless No fluorescence	<1	>80	IB: Ps. fluorescence	Salmon color	<1
31	<i>Pseudomonas fulva</i>	NZQ184	Well water	1,60E+05	>80	0	Light cream No fluorescence	<1	>80	IB:Ps spp other than PS.aeruginosa	Colorless	<1
32	<i>Pseudomonas koreensis</i>	JDS259	Marine water	6,40E+05	0	/	/	<1	0	/	/	<1
33	<i>Pseudomonas libanensis</i>	JAYT55	Marine water	2,00E+05	>80	0	Colorless No fluorescence	<1	1	/	/	<1
34	<i>Pseudomonas oleovorans</i>	PNR675	Mains water	3,40E+05	>80	0	Colorless No fluorescence	<1	2	/	/	<1
35	<i>Pseudomonas plecoglossicida</i>	PIA721	Mains water	3,60E+05	>80	0	Colorless No fluorescence	<1	>80	IB:Ps spp other than PS.aeruginosa	Colorless	<1
36	<i>Pseudomonas putida</i>	YDR143	Pond water	1,00E+05	>80	0	Colorless No fluorescence	<1	>80	IB:Ps putida	Salmon color	<1
37	<i>Pseudomonas rhodesiae</i>	JHBL55	Lake water	5,80E+05	>80	0	Light cream No fluorescence	<1	>80	IB:Ps spp other than PS.aeruginosa	Colorless	<1
38	<i>Pseudomonas stutzeri</i>	SCA003	Marine water	2,60E+05	0	/	/	<1	0	/	/	<1

				Inoculation level	Reference method - EN ISO 16266:2008*				Alternative method - CHROMagar™ p.aeruginosa			
39	<i>Pseudoxanthomonas kaohsiungensis</i>	NJM549	Mains water	1,10E+05	1	/	/	<1	1	/	/	<1
40	<i>Pseudoxanthomonas mexicana</i>	CMHT73	Mains water	1,50E+05	0	/	/	<1	0	/	/	<1
41	<i>Raoultella terrigena</i>	GWUG34	Mains water	7,20E+05	0	/	/	<1	0	/	/	<1
42	<i>Salmonella Derby</i>	MZH098	Outlet water from treatment plant	7,10E+05	0	/	/	<1	0	/	/	<1
43	<i>Serratia fonticola</i>	XUP895	River water	1,20E+05	0	/	/	<1	0	/	/	<1
44	<i>Shewanella putrefaciens</i>	MJ5	River water	1,20E+05	0	/	/	<1	0	/	/	<1
45	<i>Sphingomonas paucimobilis</i>	CKHE27	Mains water	3,20E+05	>80	0	Yellow	<1	0	/	/	<1
46	<i>Staphylococcus aureus</i>	XVE316	Process water	5,00E+05	0	/	/	<1	0	/	/	<1
47	<i>Stenotrophomonas pavanii</i>	JYUN36	Industrial water	7,70E+05	0	/	/	<1	0	/	/	<1
48	<i>Aeromonas media</i>	HYYZ27	Lake water	1,20E+05	0	/	/	<1	0	/	/	<1

#	Strain	Code strain	CHROMagar™ P.aeruginosa at 24h
4	<i>Acinetobacter pittii</i>	LPAL23	
5	<i>Aeromonas hydrophila/caviae</i>	DTH704	
30	<i>Pseudomonas fluorescens</i>	DQR669	
31	<i>Pseudomonas fulva</i>	NZQ184	
35	<i>Pseudomonas plecoglossicida</i>	PJA721	
36	<i>Pseudomonas putida</i>	YDR143	
37	<i>Pseudomonas rhodesiae</i>	JHBL55	