

Enterobacter cloacae 020

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ABSTRACT

Enterobacter cloacae 020 is a Gram-negative, facultative anaerobic, rod-shaped bacterium. It was isolated from a piglet and identified by 16S rDNA sequencing. The strain was characterized by its ability to grow on a wide range of carbon sources and to produce various enzymes. The strain was found to be highly resistant to antibiotics, including tetracycline, ampicillin, and gentamicin. The strain was also found to be highly resistant to disinfectants, including sodium hypochlorite and quaternary ammonium compounds. The strain was found to be highly resistant to heat, surviving at 129 °C for 2 h. The strain was found to be highly resistant to desiccation, surviving for 100 days at room temperature. The strain was found to be highly resistant to UV radiation, surviving for 100 h under UV light. The strain was found to be highly resistant to gamma radiation, surviving for 100 kGy. The strain was found to be highly resistant to osmotic stress, surviving at 10.0 M NaCl. The strain was found to be highly resistant to pH stress, surviving at pH 1.0 and pH 12.0. The strain was found to be highly resistant to oxidative stress, surviving in the presence of 10% hydrogen peroxide. The strain was found to be highly resistant to nitrosative stress, surviving in the presence of 100 μM nitric oxide. The strain was found to be highly resistant to oxidative and nitrosative stress, surviving in the presence of 10% hydrogen peroxide and 100 μM nitric oxide. © 2009 Elsevier B.V. All rights reserved.

1. Introduction

Enterobacter cloacae is a Gram-negative, facultative anaerobic, rod-shaped bacterium. It is a member of the family Enterobacteriaceae and the genus Enterobacter. The strain 020 was isolated from a piglet and identified by 16S rDNA sequencing. The strain was characterized by its ability to grow on a wide range of carbon sources and to produce various enzymes. The strain was found to be highly resistant to antibiotics, including tetracycline, ampicillin, and gentamicin. The strain was also found to be highly resistant to disinfectants, including sodium hypochlorite and quaternary ammonium compounds. The strain was found to be highly resistant to heat, surviving at 129 °C for 2 h. The strain was found to be highly resistant to desiccation, surviving for 100 days at room temperature. The strain was found to be highly resistant to UV radiation, surviving for 100 h under UV light. The strain was found to be highly resistant to gamma radiation, surviving for 100 kGy. The strain was found to be highly resistant to osmotic stress, surviving at 10.0 M NaCl. The strain was found to be highly resistant to pH stress, surviving at pH 1.0 and pH 12.0. The strain was found to be highly resistant to oxidative stress, surviving in the presence of 10% hydrogen peroxide. The strain was found to be highly resistant to nitrosative stress, surviving in the presence of 100 μM nitric oxide. The strain was found to be highly resistant to oxidative and nitrosative stress, surviving in the presence of 10% hydrogen peroxide and 100 μM nitric oxide.

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2. Methods

2.1. Microorganism culture

Enterobacter cloacae 020 was cultured in Luria-Bertani (LB) broth. The cells were grown at 37 °C for 24 h. The cells were harvested by centrifugation at 1000 × g for 5 min. The cells were washed with phosphate-buffered saline (PBS) and resuspended in PBS. The cells were then adjusted to a concentration of 10⁸ CFU/ml. The cells were then used for various experiments.

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2.2. Isolation and purification of the selenium exopolysaccharide

00× 20 ... 9 % ... (2. × 0) ... 0 0. ... -100 (1. × 0) ... 12 / ... -1. ... (999) ... 0 ... (L ... λ - .1 , λ - 1 ...

2.3. Immunomodulatory activity evaluation of Se-ECZ-EPS-1

0L 10 ... (1 2) ... -1 (0, 200 ... 00 / ... 0 / ... 12 ... 0.2 ... 0.1% ... 10 ... /100 ... × 10 / ... 100 μ / ... 2. μ / ... 100μ ... 10μ / ... % 2, 20 μ ... 100μ ... 0 ...

2.4. Statistical analysis

... t- ... p < 0.0 ...

3. Results

3.1. Biotransformation of selenite and red-Se phenomenon

(... 20 μ /) ... *Enterobacter cloacae* 020 (...) ... (0) ... 20 μ / ...

Enterobacter cloacae 020 , ...

3.2. Isolation, purification and general properties of Se-ECZ-EPS-1

(... 1). ... -100, ... -12% ... -1 ... 9 1. % , 0. %9 % , ... α- ... -1 129 2 / .

3.3. Immune activity of Se-ECZ-EPS-1

(... 1). ... (p < 0.0) ... -1 ...

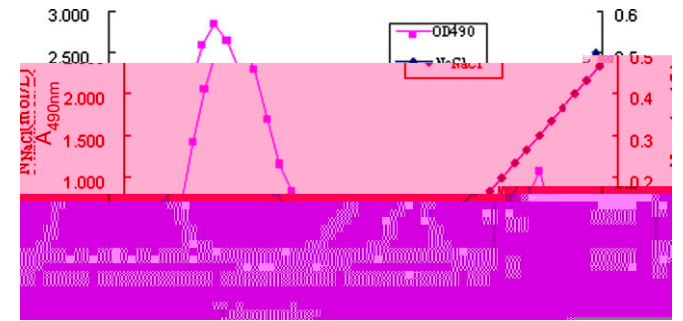


Fig. 1. ... (2. × 0) ... 0 0. ...

Table 1

| | / -1 | i | i |
|----------|------|-------------|--------------|
| | 0 | 0. 2 ±0.09 | 0. ±0.01 |
| + - - -1 | 200 | 0. 2 ±0.00 | 0.1 ±0.010 |
| + - - -1 | 00 | 0. 9 ±0.012 | 0.9 1 ±0.011 |
| | | 0. 2 ±0.022 | 0.222 ±0.010 |

(, ,) i ... (p < 0.0) .

Table 2

| | / -1 | A o | |
|----------|------|-------------|-------------|
| | 0 | 0. ±0.01 | 0. ±0.020 |
| + - - -1 | 200 | 0. ±0.0 | 0.29 ±0.01 |
| + - - -1 | 00 | 0. 9 ±0.02 | 0.29 ±0.00 |
| | | 0. 12 ±0.01 | 0. 0 ±0.012 |

(, ,) i ... (p < 0.0) .

(2). - - -1 (00 / . .)
 - - -1
 ($p < 0.0$)
 ()

4. Discussion

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5. Conclusion

Enterobacter cloacae 020
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Acknowledgements

(200 120 1).

References

Bacillus licheniformis L
 200 1
Fomes formentarius 99, 1 9
Lycium barbarum L
 99 9
 200 L
 2
 999
 0
 10, 101, 11
Spirulina platensis 200 9, 1 1 2
 200
 200
P. Agglomerans 9
 1 2, 12 19
 99 1
 19 1200
 200
 200
 12 12
 200 L
 1, 9 1
 200 L
Chondrus ocellatus 0
 200
 () 00 10