



ANTIBACTERIAL ACTIVITY OF EXTRACELLULAR COMPOUNDS PRODUCED BY *PSEUDOMONAS aeruginosa* LV STRAIN AGAINST MULTIDRUG-RESISTANT BACTERIA

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Abstract: The emergence of multidrug-resistant (MDR) bacteria increasing than the discovery of new antibiotics compounds, causing a public world health crisis [1, 2]. We report a new antibiotic named Lemicina, produced by *Pseudomonas aeruginosa* LV strain (Patent, 2008#PI0803350-1; <http://www.inpi.gov.br>). The correlation between copper concentration and Lemicina production in broth culture was evaluated and performed by HPLC. The extracellular compounds were purified by vacuum and flash liquid chromatography and the bactericide activity against *Klebsiella pneumoniae* (ATCC 10031), *Enterococcus faecium* (ATCC 6569), and clinical isolated, Methicillin-Resistant *Staphylococcus aureus* (MRSA 315 and MRSA BEC9393), Vancomycin-Resistant enterococci (VRE 170) e Carbapenem-Resistant Enterobacteriaceae, *Klebsiella pneumoniae* (CRE, *Kpn* 19) were tested by agar diffusion technique, minimal inhibitory concentration (MIC) and minimal bactericide concentration (MBC). The results obtained show that the chromatography analytical methodology is accurate, reproducible and linear Culture of LV strain with 25 mg L⁻¹ of Cu⁺² was a greatest Lemicina producer and the compound showed high antibiotic activity against all strains tested with MIC's and MBC's ≤ 2 µg mL⁻¹ (See Table 1). The unspecific antibiotic activity of Lemicina indicated that this compound should be a new alternative to control infection caused by MDR.

References:

- [1] Cardozo, V.F., de Oliveira, A.G., Nishio, E.K., Perugini, M.R.E., Andrade, C.G.T.J., Silveira, W.D., Durán, N., Andrade, G., Kobayashi, R.K.T. and Nakazato, G. 2013. Antibacterial activity of extracellular compounds produced by a *Pseudomonas* strain against methicillin-resistant *Staphylococcus aureus* (MRSA) strains. *Annals of Clinical Microbiology and Antimicrobials* 12:12.
- [2] Ling, L.L., Schneider, T., Peoples, A., Spoering, A., Engels, I., Conlon, B.P., Mueller, A., Schaberle, T.F., Hughes, D.E., Epstein, S., Jones, M., Lazarides, L., Steadman, V.A., Cohen, D.R., Felix, C.R., Fetterman, K.A., Millett, W.P., Nitti, A.G., Zullo, A.M., Chen, Ch. and Lewis, K. 2015. A new antibiotic kills pathogens without detectable resistance. *Nature* 517, 455-459.

Table 1: Antibiotic activity of Lemicina against multidrug-resistant bacteria.

Organism	Genotype	MIC(µg mL ⁻¹)	MBC(µg mL ⁻¹)	Inhibition zone (mm±SD*)
<i>S. aureus</i>	MRSA (315)	0.5	1.0	30±0.5
	MRSA (BEC9393)	1.0	2.0	27±0.5
<i>E. faecium</i>	ATCC 6569	1.0	2.0	21±1.5
	EVR (170)	2.0	2.0	22±1.0
<i>K. pneumoniae</i>	ATCC 10031	1.0	1.0	23±1.0
	CRE (<i>kpn</i> 19)	2.0	2.0	19±0.5

*Standard Deviation.