EFFECTS OF THE NOVEL CATIONIC DISINFECTANT FORMULATIONS ON EXTRACELLULAR RESISTANCE PLASMID DNA

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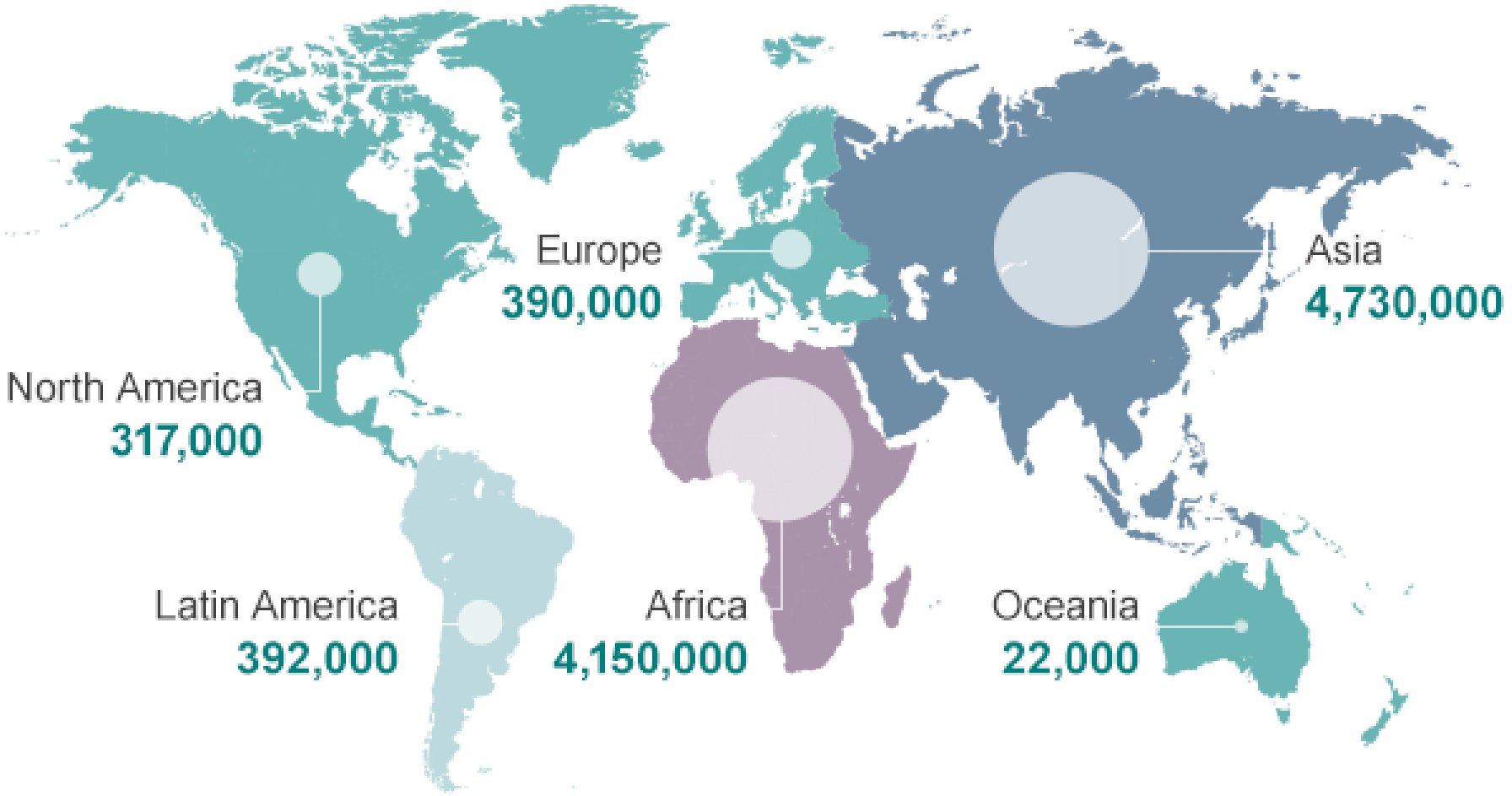
Deaths attributable to antimicrobial resistance every year by 2050



Source: Review on Antimicrobial Resistance 2014

Retrieved from https://www.weforum.org/agenda/2016/09 on 25-Nov-2017

Time Kill Assay of a Developed Formulation VS EU-Product (High Level Disinfectant)

References cultures	Contact time (minute)			
	0.1% Developed formulation	0.5% Developed formulation	0.1% EU-Product	0.5% EU-Product
S. aureus	1	1	1	1
B. subtilis	1	1	1	1
B. Cereus ATCC11778	1	1	1	1
P. aeruginosa ATCC27853	**1**	**1**	**> 10**	**> 10**
P. aeruginosa MT	**1**	**1**	**> 10**	**> 10**
P. mirabilis	**5**	5	**10**	2.5
S. maltophilia	1	1	1	1
K. pneumoniae	1	1	1	1
S. enteritidis	1	1	1	1

Results from Department of Microbiology, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

Time Kill Assay of a Development Formulation VS EU-Product (High Level Disinfectant)

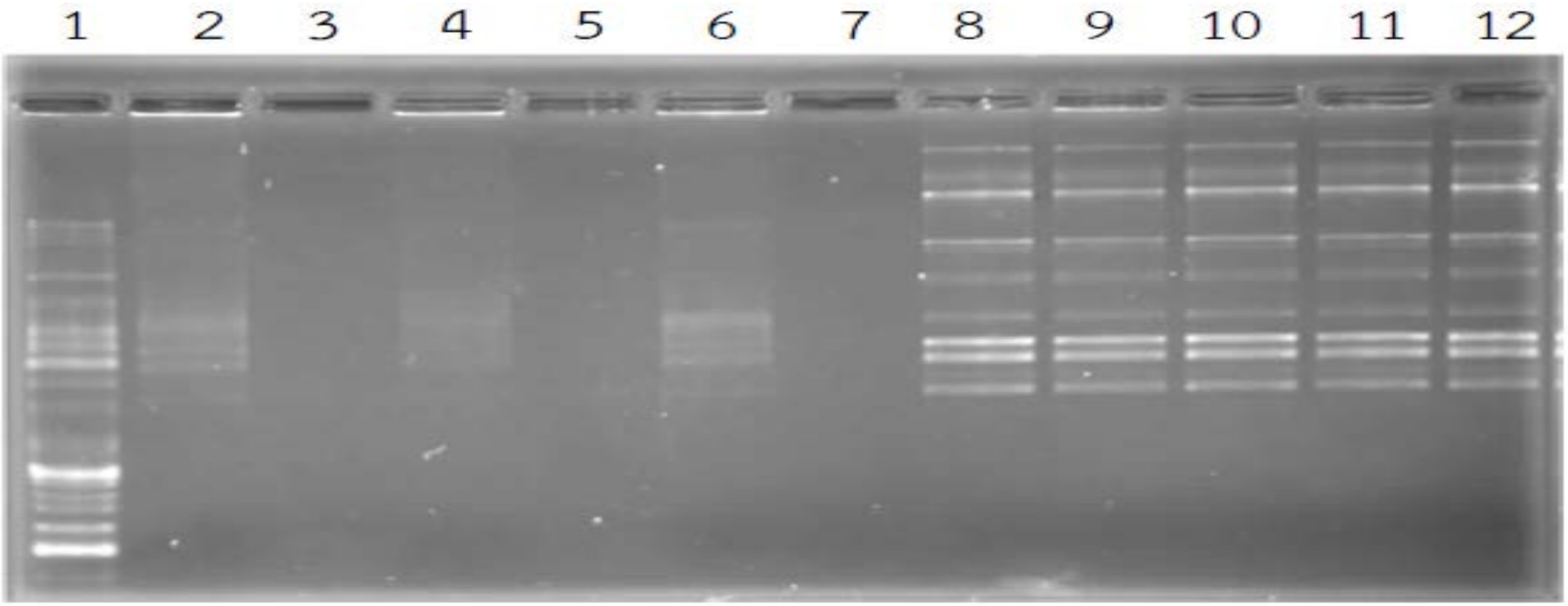
Reference cultures	Contact time (minute)			
	0.1% Novel Formulation	0.5% Novel Formulation	0.1% EU-Product	0.5% EU-Product
MRSA	1	1	1	1
VRE	1	1	1	1
ESBL	1	1	1	1
A. baumanii	1	1	1	1
C. difficile	1	1	1	1
M. tuberculosis H37Rv (reference strain)	1	1	nd	nd
Multidrug-resistant M. tuberculosis (MDR-TB)	1	1	nd	nd
M. avium (Nontuberculous mycobacteria; NTM)	1	1	nd	nd
C. perfringen	1	1	> 10	1

STEREX® S:

1. Efficient formulation against microbial pathogens and antibiotic-resistant microbial pathogens
2. The oral LD_{50} in Wistar rats is greater than 5,000 mg/kg body weight
3. No reported allergy symptoms in human skin allergy test.

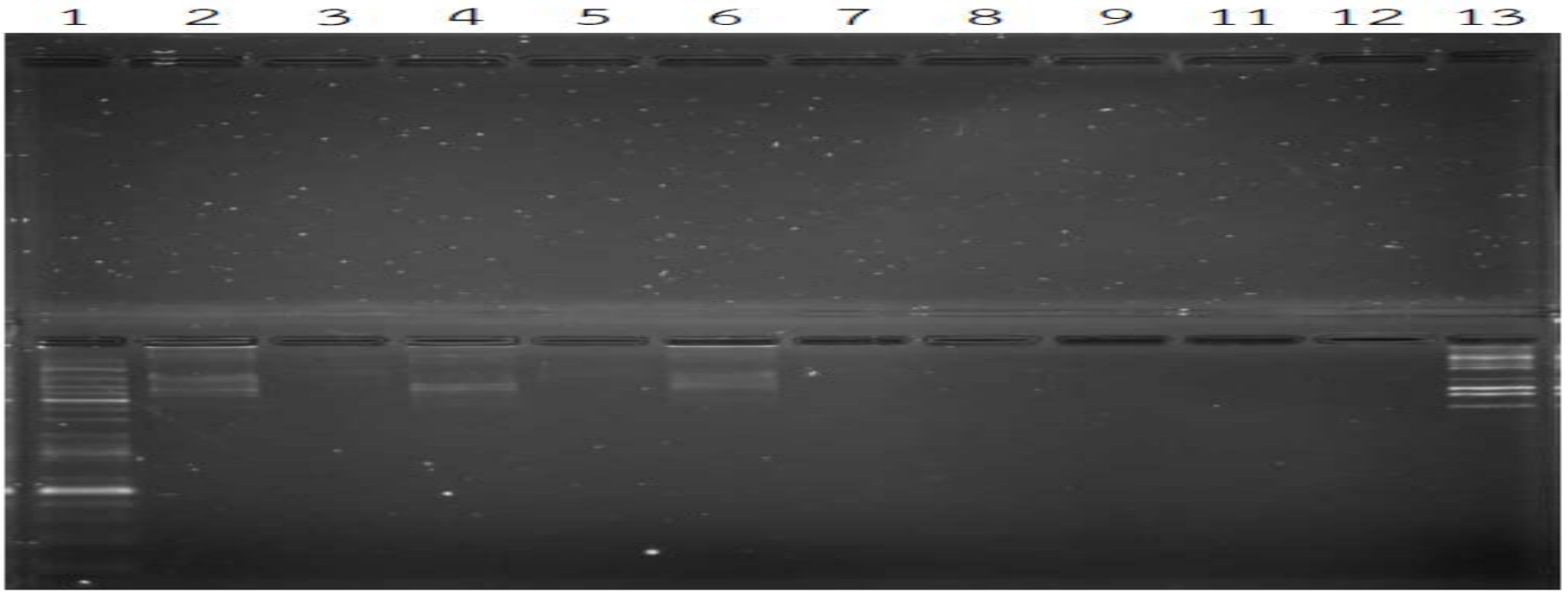
EFFECTS OF THE NOVEL CATIONIC DISINFECTANT FORMULATIONS ON EXTRACELLULAR RESISTANCE CARRYING *mcr-1* or bla_{NDM-1} PLASMID DNA

Effects of a Developed Formulations to Plasmid DNA Carrying *mcr-1* (1)



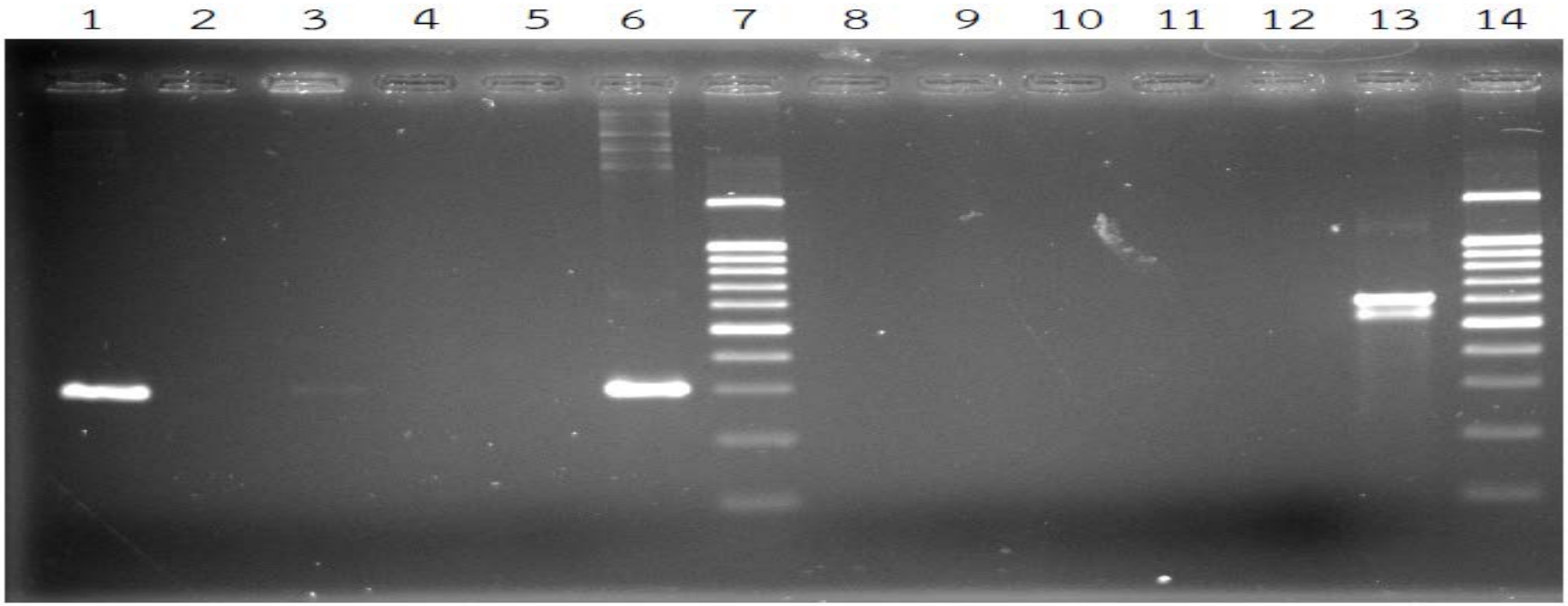
Lane 1: Marker
Lane 2 & 3: Plasmid DNA + 0.1% & 0.5% Formulation A
Lane 4 & 5: Plasmid DNA + 0.1% & 0.5% Formulation B
Lane 6 & 7: Plasmid DNA + 0.1% & 0.5% Formulation D
Lane 8 & 9: Plasmid DNA + 0.1% & 0.6% Formulation E (Version-I)
Lane 10 & 11: Plasmid DNA + 0.1% & 0.6% Formulation F (Version-I)
Lane 12: Plasmid DNA

Effects of a Developed Formulations to Plasmid DNA Carrying *mcr-1* (2)



Lane 1: Marker
Lane 2 & 3: Plasmid DNA + 0.1% & 0.5% Formulation A
Lane 4 & 5: Plasmid DNA + 0.1% & 0.5% Formulation B
Lane 6 & 7: Plasmid DNA + 0.1% & 0.5% Formulation D
Lane 8 & 9: Plasmid DNA + 0.1% & 0.5% Formulation E (Version-II)
Lane 11 & 12: Plasmid DNA + 0.1% & 0.5% Formulation F (Version-II)
Lane 13: Plasmid DNA

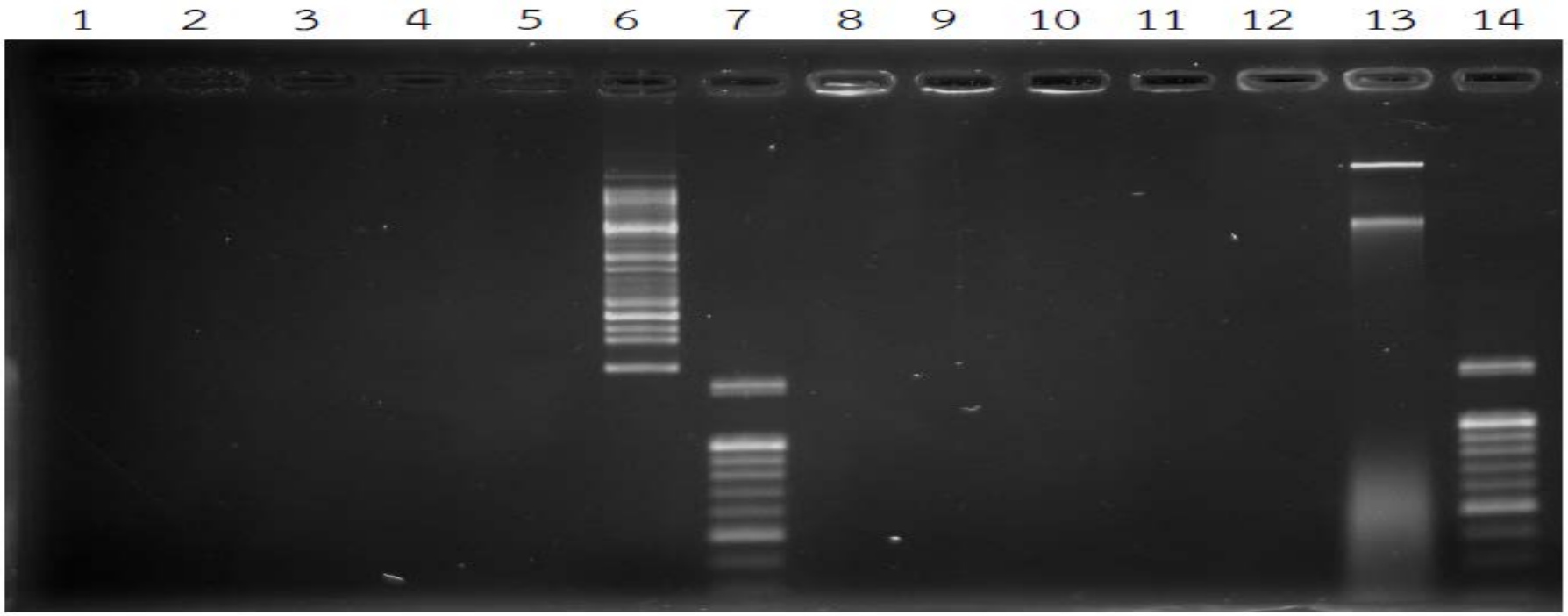
Effects of a Developed Formulations to Plasmid DNA Carrying *mcr-1* or bla_{NDM-1} (1)



Lane 1: Plasmid DNA (*mcr-1*) + 0.1% (A)
Lane 2: Plasmid DNA (*mcr-1*) + 0.1% (B)
Lane 3: Plasmid DNA (*mcr-1*) + 0.1% (D)
Lane 4: Plasmid DNA (*mcr-1*) + 0.1% (E2)
Lane 5 : Plasmid DNA (*mcr-1*) + 0.1% (F2)
Lane 6: Plasmid DNA (*mcr-1*)
Lane 12: Marker

Lane 8: Plasmid bla_{NDM-1} + 0.1% (A)
Lane 9: Plasmid bla_{NDM-1} + 0.1% (B)
Lane 10: Plasmid bla_{NDM-1} + 0.1% (C)
Lane 11: Plasmid bla_{NDM-1} + 0.1% (E2)
Lane 12: Plasmid bla_{NDM-1} + 0.1% (F2)
Lane 13: Plasmid bla_{NDM-1}
Lane 14: Marker

Effects of a Developed Formulations to Plasmid DNA Carrying *mcr-1* or bla_{NDM-1} (2)



Lane 1: Plasmid DNA (*mcr-1*) + 0.5% (A)
Lane 2: Plasmid DNA (*mcr-1*) + 0.5% (B)
Lane 3: Plasmid DNA (*mcr-1*) + 0.5% (D)
Lane 4: Plasmid DNA (*mcr-1*) + 0.5% (E2)
Lane 5 : Plasmid DNA (*mcr-1*) + 0.5% (F2)
Lane 6: Plasmid DNA (*mcr-1*)
Lane 12: Marker

Lane 8: Plasmid bla_{NDM-1} + 0.5% (A)
Lane 9: Plasmid bla_{NDM-1} + 0.5% (B)
Lane 10: Plasmid bla_{NDM-1} + 0.5% (C)
Lane 11: Plasmid bla_{NDM-1} + 0.5% (E2)
Lane 12: Plasmid bla_{NDM-1} + 0.5% (F2)
Lane 13: Plasmid bla_{NDM-1}
Lane 14: Marker

Conclusion

We produced new cationic disinfectant formulations for killing of antibiotic resistant bacteria along with their resistance genes that may be released upon killing action. Washing vegetables/raw food with novel cationic disinfectant formulations could be useful in reducing risks of resistant bacterial contamination and risk of resistance gene propagation.

Acknowledgements

I-ANALY-S-T
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