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Determination of bactericidal activity of bacilloid by phenol coefficient method

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Abstract

Bacilloid is diluted from 1:600 to 1:1000 and phenol disinfectant is diluted from 1:100 to 1:120. Their bactericidal activity is determined against *Acinetobacter* spp suspension. Subcultures are performed from both the test disinfectant i.e. bacilloid and phenol at intervals of 5, 10, 15 and 20 minutes. The plates are incubated for 48-72 hours at 37 °C. The dilution of disinfectant, which disinfects the suspension in a given time is divided by that dilution of phenol, which disinfects the suspension in same time, determines its phenol coefficient.

Keywords: Bacilloid Special; Phenol disinfectant; *Acinetobacter* spp.

1. Introduction

Disinfectants used in hospitals and laboratories must be tested periodically to ascertain its potency and efficacy. As certain disinfectants lose potency on standing and addition of organic matter, their efficacy must be tested. While certain methods help in selecting the right dilution of disinfectant for use, others test the efficacy of disinfectant already in use.

Some methods compare the performance with that of phenol whereas other methods simply state if the disinfectant is effective or not. There are several methods of testing disinfectants, with their own advantages and disadvantages.

In our experiment, a qualitative suspension test is used.

In this test, a sample of the bacterial culture is suspended into the disinfectant solution and after exposure it is verified by subculture whether this inoculum is killed or not.

A loopful of bacterial suspension was brought into contact with the disinfectant for a certain time and again a loopful of this mixture was cultured for surviving organisms.

Results were expressed as 'Growth' or 'No growth'.

2. Materials and Methods

Composition of Bacilloid (Each 100 gm)

- 1,6 Dihydroxy, 2-5 Dioxahexane 11.2g
- Glutaraldehyde 5.0g
- Benzalkonium Chloride 5.0g
- Alkyl Urea Derivatives 3.0g

Packing size

5 Ltrs Jar / 2 Jar = 1 Carton

Bacilloid is diluted from 1:600 to 1:1000 and phenol disinfectant is diluted from 1:100 to 1:120. Their bactericidal activity is determined against *Acinetobacter* spp suspension.

For 48-72 hours at 37 °C. The end results are indicated as 'Growth' or 'No Growth'.

The dilution of bacilloid disinfectant, which disinfects the suspension in a given time is divided by that dilution of phenol, which disinfects the suspension in same time, determines its (Bacilloid) phenol coefficient.

3. Result

Acinetobacter spp was killed by bacilloid disinfectant after 5, 10, 15 and 20 minutes at dilutions of 1:600, 1:700, 1:800 and 1:900 respectively as shown in the table above, whereas, almost in the same period of time i.e. after 10, 15 and 20 minutes, the test organism was killed by phenol at dilutions of 1:100, 1:105 and 1:115 respectively.

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Disinfectant	Dilution	Growth of <i>Acinetobacter spp</i> in subculture on chocolate agar after a certain period of time			
		5 minutes	10 minutes	15 minutes	20 minutes
Bacillocid	1:600	NG	NG	NG	NG
	1:700	G	NG	NG	NG
	1:800	G	G	NG	NG
	1:900	G	G	G	NG
	1:1000	G	G	G	G
Phenol	1:100	G	NG	NG	NG
	1:105	G	G	NG	NG
	1:110	G	G	G	NG
	1:115	G	G	G	NG
	1:120	G	G	G	G

4. Discussion

As an example, after 10 minutes, *Acinetobacter spp* was killed or inhibited by bacillocid at a dilution of 1:700 whereas, the growth of the test organism i.e. *Acinetobacter spp* was inhibited by phenol in 1:100 dilution. Hence, phenol coefficient of bacillocid can be calculated as below: -

$$\text{Phenol Coefficient} = 700 / 100 = 7$$

5. Conclusion

The result of this study clearly indicates that bacillocid can be diluted seven times higher than phenol to get the same result at a certain period of time. That means effectiveness of bactericidal activity of bacillocid is seven times higher than phenol, and bacillocid can be applied on an inanimate object as effective disinfectant to get the same result at a certain period of time with much lesser volume.

Glutaraldehyde combines with chemically bound formaldehyde (1, 6 Dihydroxy, 2-5 Dioxahexane) in hydrolyzation with water, to provide excellent microbicidal activity over phenol.

Only 30% of the formaldehyde is used, the rest is released, only when there is an addition of new contaminants. Benzalkonium Chloride and Alkyl Urea Derivatives serve as surfactants.

6. Acknowledgement

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7. Conflict of Interests

The author declares that there is no conflict of interests regarding the publication of this paper.

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