

دراسات عن تأثير بعض المطهرات الشائعة الاستعمال على
بعض الفطريات

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- ١ - لقد قورنت قدرة بعض أنواع من المطهرات (البروفيل فنيك عابدين الفنيك النقى ، الكراون أيدوكور ، اسكوسيت لبن الجير وماء الجير) على قتل بعض أنواع من الفطريات وهى أسبرجيلس فلافس أسبرجيلس نيجر ، كانديدا البيكانس كانديدا كروزباى ، كانديدا جيلر موندباى ، كانديدا باراسيلوزيس ، كانديدا سودوتروبىكالس كانديدا ستلاتويدا ، كانديدا تروبىكالس ، الرودتوريلا روبرا - التروبولويسس كوليكولوزا والتروبولويسس فيرستيا ليس •
- ٢ - كان البروفيل هو أقوى المطهرات القاتلة للفطريات سواء كان معلقة فى محلول ملح فسيولوجى أو الملوثة للاسطح تحت الاختبار يليه فى قدرته الكراون ، الايدوكوروفنيك عابدين ثم الناسكوسبت •
- ٣ - بالنسبة للفنيك النقى كان متوسط تخفيفه القاتل للفطريات المعلقة فى محلول ملح هو = ٥٨:١ ولكن هذا المحلول لا يستخدم فى تطهير الاسطح نظرا لتكلفته المرتفعة •
- ٤ - لوحظ أن لبن الجير وماء الجير يفقدان القدرة على التطهير السريع سواء بالنسبة للفطريات المعلقة فى محلول ملح فسيولوجى أو الملوثة للاسطح تحت الاختبار •

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**STUDIES ON THE FUNGICIDAL ACTION OF SOME
COMMON DISINFECTANT**
(With 6 Tables)

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SUMMARY

- 1 - The fungicidal power of seven disinfectants was compared with that of pure phenol on different fungal species.
- 2 - Prophyl was found to be the most effective fungicidal disinfectant followed by Crown, Iodocor, Phenique Abdin and Nascosept.
- 3 - Pure phenol, its mean effective fungicidal dilution was 1:58 for fungi suspended in saline, but this preparation is not used for surface disinfection as it was very expensive.
- 4 - Milk of lime and lime wash were found to lack any disinfection power against fungi suspended in saline or on any contaminated surfaces under test.

INTRODUCTION

Over a period of many years, disinfection was the subject of extensive studies. Many investigators have used many phenolic compound and surface active agents as a fungicides (TKACICK, 1969; SHEKLAKOV and MILICH, 1974; HEGNA, 1977; HUSSIN, 1978).

The aim of the present work was done to evaluate the fungicidal power of some disinfectants against some fungi affecting various inanimate objects of human and animal importance.

MATERIAL and METHODS

Experiment 1:

For estimating the fungicidal power of the used disinfectant in saline (AOAC, 1980).

1) Test fungi:

The following fungi were used:

- | | |
|------------------------------------|----------------------------------|
| a) <i>Aspergillus flavus</i> | b) <i>Aspergillus niger</i> |
| c) <i>Candida albicans</i> | d) <i>Candida guilliermondii</i> |
| e) <i>Candida krusei</i> | f) <i>Candida parapsilosis</i> |
| g) <i>Candida pseudotropicalis</i> | h) <i>Candida stelloidea</i> |
| i) <i>Candida tropicalis</i> | j) <i>Rhodotrula rubra</i> |
| k) <i>Torulopsis colliculosa</i> | l) <i>Torulopsis versitalis</i> |

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These strains were obtained from Department of Microbiology and Animal Hygiene, Faculty of Veterinary Medicine, Alexandria University.

2) **Media:**

- a) Sabouraud's glucose agar (Difco)
- b) Sabouraud's glucose broth (Difco)

3) **Disinfectants:****- Phenols:**

- a) Phenique Abdin (Nile Co.)
- b) Pure phenol (Medex chem. Co.)
- c) Prophyl (Merial Lab. France)

- Iodophors:

- a) Crown (Crown chem. Co.)
- b) Iodocor (Socoor, Milano)

- Quaternary ammonium compound:

- Nascosept (El-Nasr Chem. Co.)

- Slaked Limes:

- a) Milk of lime
- b) Lime wash

Experiment II:

For estimating the fungicidal power of the used disinfectants in the practice and for quick disinfection of contaminated surfaces (KRUSE, 1964).

The test fungi, media and the disinfectants used as previously mentioned in connection with experiment I but the contaminated inanimate objects used were:

- a) Concrete
- b) Leather
- c) Wood
- d) Plastic

RESULTS and DISCUSSION

The discussion of the obtained results could be achieved by comparing the resistance of the different fungi to every disinfectant. Prophyl was found to be the most powerful disinfectant since its mean dilution for killing fungi suspended in saline was found to be 1:103, while for disinfecting of contaminated concrete 1:45, 1:51 for plastic and 1:54 for leather and wood (Table 1).

In view of the data illustrated in table 1, it can be noticed that the average dilution of phenique Abdin to kill fungi in saline was 1:22 however, its fungicidal dilution for quick disinfection was 1:1 for concrete and wood and 1:2 for leather and plastic. These results confirm the work of SMITH and CONANT (1969), ALI (1969), TKACICK (1969) and SHEKLOKOV and MILICH (1974).

Crown, followed prophyl in its fungicidal potency as its mean dilution for killing fungi suspended in saline was found to be 1:80. For quick disinfection of contaminated concrete it was 1:11, 1:13 on leather, 1:14 on wood 1:17 on plastic.

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On the other hand, Iodocor was the third in fungicidal potency as its average fungicidal dilution was 1:61 on fungi suspended in saline however, its quick fungicidal power on concrete was 1:10, 1:11 on wood and leather; and 1:12 on plastic. These results support the work performed by ALLAWALA and RIEGELMAN (1953) and HUSSIN (1978).

From the results recorded in table (1), it has been found that, Nascosept ill fungi in saline at a concentration of 1:17 however, its mean fungicidal dilution for quick disinfection was 1:1 for all surfaces.

The analysis of the results recorded in table (1, 2, 3, 4, 5, 6) showed that Nascosept significantly more potent than milk of lime and lime wash on all experiments. However, it is significantly less potent than prophyl, crown and iodocor on all surfaces except on concrete. Moreover, Nascosept is significantly less potent on leather and plastic than phenique Abdin (Table 1, 2, 3, 4, 5, 6). These results confirm the work of EL-BAHAY, *et al.* (1975).

Pure phenol was found to kill fungi in saline at a concentration of 1:58 but this preparation is not used for surface disinfection as it was expensive. Moreover, Milk of lime and lime wash were found to lack any disinfection power against fungi suspended in saline or on any contaminated surface under test which in agreement with those reported by MOUSTAFA, *et al.* (1975).

Generally, milk of lime and lime wash are significantly less powerful than other disinfectants. Nascosept is less potent significantly than Prophyl, Crown, Iodocor and Phenique Abdin. Phenique Abdin is significantly less potent than Prophyl, Crown and Iodocor. Prophyl is the most powerful disinfectant under test then Crown and then Iodocors, although they are not significantly different from each other.

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Table (1)
Showing the mean effective dilution of the disinfectants under test

Disinfectant	Fungi suspended in saline	Mean effective dilution of Fungi contaminated			
		concrete	plastic	leather	wood
Prophyl	1:103	1:45	1:51	1:54	1:54
Pure phenol	1:58	----	----	----	----
Phenique Abdin	1:22	1:1	1:2	1:2	1:1
Crown	1:80	1:11	1:17	1:13	1:14
Iodocor	1:61	1:10	1:12	1:11	1:11
Nascosept	1:7	1:1	1:1	1:1	1:1
Milk of lime	----	----	----	----	----
Lime wash	----	----	----	----	----

Table (2)
Showing the effect of disinfectants (D) on fungi suspended in saline

D.	Time	Aspergillus				Candida				Rodo.		Torulepsis	
		flavus	niger	alb. guill.	krusei	parap.	pseud.	stell.	trop.	rubra	colli.	versi.	
Prophyl	2.30	1:140	1:100	1:120	1:100	1:100	1:100	1:100	1:100	1:100	1:60	1:60	1:60
	5.00	1:140	1:120	1:80	1:100	1:100	1:100	1:100	1:100	1:100	1:80	1:80	1:80
	10.0	1:160	1:120	1:120	1:80	1:120	1:120	1:100	1:100	1:120	1:100	1:120	1:100
	15.0	1:160	1:140	1:120	1:80	1:140	1:120	1:100	1:140	1:120	1:100	1:120	1:100
Phenique Abdin	2.30	1:1	1:1	1:40	1:20	1:20	1:20	1:10	1:20	1:20	1:10	1:20	1:20
	5.00	1:40	1:1	1:40	1:20	1:20	1:20	1:10	1:20	1:20	1:20	1:40	1:20
	10.0	1:40	1:10	1:60	1:20	1:20	1:40	1:10	1:40	1:40	1:20	1:40	1:40
	15.0	1:60	1:10	1:60	1:20	1:40	1:60	1:40	1:40	1:40	1:20	1:40	1:40
Pure phenol	2.30	1:40	1:20	1:60	1:40	1:60	1:40	1:40	1:40	1:40	1:40	1:60	1:40
	5.00	1:40	1:40	1:60	1:40	1:100	1:60	1:40	1:60	1:80	1:60	1:60	1:80
	10.0	1:60	1:40	1:60	1:40	1:100	1:80	1:40	1:80	1:100	1:60	1:60	1:80
	15.0	1:60	1:40	1:60	1:40	1:100	1:100	1:40	1:80	1:100	1:80	1:100	1:100
Crown	2.30	1:60	1:60	1:80	1:60	1:80	1:80	1:60	1:80	1:60	1:40	1:60	1:60
	5.00	1:100	1:60	1:80	1:80	1:100	1:80	1:80	1:100	1:80	1:40	1:80	1:80
	10.0	1:100	1:80	1:80	1:100	1:100	1:100	1:80	1:120	1:80	1:40	1:80	1:80
	15.0	1:120	1:80	1:80	1:100	1:100	1:120	1:80	1:120	1:100	1:60	1:120	1:120
Iodocor	2.30	1:0	1:40	1:40	1:40	1:60	1:40	1:40	1:60	1:40	1:40	1:60	1:60
	5.00	1:60	1:40	1:40	1:40	1:60	1:80	1:40	1:60	1:60	1:40	1:80	1:60
	10.0	1:60	1:60	1:60	1:60	1:80	1:80	1:40	1:80	1:80	1:60	1:80	1:60
	15.0	1:60	1:80	1:60	1:80	1:80	1:100	1:80	1:100	1:80	1:80	1:100	1:100
Nascosept	2.30	1:1	1:1	1:20	1:1	1:1	1:10	1:1	1:10	1:20	1:10	1:10	1:10
	5.00	1:10	1:1	1:20	1:1	1:10	1:10	1:1	1:10	1:20	1:10	1:10	1:10
	10.0	1:10	1:1	1:20	1:1	1:10	1:20	1:1	1:10	1:20	1:10	1:10	1:10
	15.0	1:10	1:1	1:20	1:1	1:20	1:40	1:10	1:10	1:20	1:10	1:20	1:10

Milk of lime and Lime wash have no fungicidal effect .

alb. : albicans	pseud. : pseudotropicalis	Rodo. : Rhodotorula
guill. : guilliermondii	stell. : stellatoidea	colli. : colliculosa
parap. : parapsilosis	trop. : tropicalis	versi. : versitalis

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Table (3)
Showing the effect of disinfectants (D) on fungi contaminating concrete

D.	Time	Aspergillus				C a n d i d a				Rodo. rubra	Torulopsis		
		flavus	niger	alb.	guill.	krusei	parap.	pseud.	stell.		trop.	colli.	versi.
Phenique Prophyl	5.00	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40
	10.0	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40
	15.0	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40
	20.0	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40
Phenique Abcin	5.00	1:1		1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	10.0	1:1		1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	15.0	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	20.0	1:1	1:1	1:1	1:10	1:1	1:10	1:1	1:1	1:1	1:1	1:1	1:1
Crown	5.00	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
	10.0	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
	15.0	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
	20.0	1:10	1:10	1:10	1:20	1:20	1:20	1:10	1:20	1:20	1:20	1:20	1:20
Iodocor	5.00	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
	10.0	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
	15.0	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
	20.0	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:20	1:10
Masco- sept	5.00	1:1		1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	10.0	1:1		1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	15.0	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	20.0	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1

Milk of lime and Lime wash have no fungicidal effect .

alb. : albicans pseud. : pseudotropicalis Rodo. : Rhodotorula
guill.: guilliermondii stell. : stellatoidea colli.: colliculosa
parap.: parapsilosis trop. : tropicalis versi.: versitalis

Table (4)
Showing the effect of disinfectants (D) on fungi contaminating leather

D.	Time	Aspergillus				C a n d i d a				Rodo. rubra	Torulopsis		
		flavus	niger	alb.	guill.	krusei	parap.	pseudo.	stell.		trop.	colli.	versi.
Phenique Prophyl	5.00	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:40	1:60	1:40	1:40	1:60
	10.0	1:40	1:40	1:60	1:60	1:60	1:60	1:60	1:60	1:60	1:40	1:60	1:60
	15.0	1:40	1:40	1:60	1:60	1:60	1:60	1:60	1:60	1:60	1:40	1:60	1:60
	20.0	1:60	1:40	1:80	1:80	1:80	1:60	1:60	1:60	1:60	1:60	1:80	1:60
Phenique Abcin	5.00	1:1		1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	10.0	1:1		1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	15.0	1:1	1:1	1:1	1:1	1:10	1:1	1:1	1:1	1:10	1:10	1:10	1:1
	20.0	1:1	1:1	1:10	1:10	1:10	1:10	1:1	1:10	1:10	1:20	1:10	1:10
Crown	5.00	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
	10.0	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
	15.0	1:20	1:10	1:20	1:20	1:20	1:10	1:20	1:20	1:10	1:20	1:20	1:20
	20.0	1:20	1:10	1:20	1:20	1:20	1:20	1:20	1:20	1:20	1:20	1:20	1:20
Iodocor	5.00	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
	10.0	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
	15.0	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10
	20.0	1:10	1:10	1:20	1:10	1:20	1:10	1:10	1:10	1:20	1:10	1:20	1:10
Masco- Sept	5.00	1:1		1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	10.0	1:1		1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	15.0	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	20.0	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1

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