RESULTS

I - Nigella sativa L. :

(A) The light pet. extract of Nigella sativa L. :

The light pet. extract of *Nigella sativa* L.caused inhibitedgrowth of *Staph. aureus.* but did not cause inhibition of growth in other tested organism (*E. coli, Sal. typhimurium, Ps. aeruginosa* and *Strept. Faecalis*) table (1), photograph (1).

(B) The diethyl ether extract of Nigella sativa L. :

The diethyl ether extract of *Nigella sativa.* produced a good inhibition zone in case of *Staph. aureus, Strept. faecalis* and *Ps. aeruginosa* but the same extract of *Nigella sativa* L. caused inhibition zone in case of *E. coli* and *Sal. typhimurium* table (2), photograph (2, 3,4,5).

(C) The aqueous alcoholic extract of Nigella sativa L. :

The aqueous alcoholic extract of *Nigella sativa* L. caused inhibition zone in case of *Staph. aureus* and *Strept. faecalis,* but did not cause inhibition zone in case of any other tested organisms, (*E. coli, Sal. typhimurium* and *Ps. aeruginosa*) table (3), photograph (6,7).

II - Peganum harmala L. :

(A) The light pet. extract of Peganum harmala L. :

Disc impregnated with different concentrations of light pet. extract of *Peganum harmala* L. (100, 200, 400, 800 µg/disc) did not cause inhibition zones in plates inoculated with all tested organism (*Staph. aureus, Strept. faecalis, Sal. taphimurium* and *Ps. aeruginosa*).

(B) The diethyl ether extract of Peganum harmala L. :

Disc prepared from diethyl ether extract of *Peganum harmala* L. showed weak antibacterial activity on tested organisms (*Staph. aureus, Strept. faecalis* and *Ps. aeruginosa*) but did not cause inhibition zones in case of *Sal. typhimurium* and *E. coli*) table (4).

(C) The aqueous alcoholic extract of Peganum harmala L. :

Disc prepared from aqueous alcoholic extract of *Peganum harmala* L. produced good inhibition zones in case of *Staph. aureus, Strept. faecalis, Sal. typhimurium* and *E. coli* but did not cause any inhibition zone in case of *Ps. aeruginosa* table (5), photograph (8,9,10,11).

III - Ambrosia maritima L. :

Our experimental work on the light pet., diethyl ether and aqueous alcoholic extract of Ambrosia maritima L. showed no any

inhibition zones on the tested organisms (*Strept. faecalis, Sal. typhimurium, Staph. aureus, Ps. aeruginosa* and *E. coli*).

IV - Carthamus tinctorius L. :

Impregnated disc with light pet. and diethyl ether and aqueous alcoholic extract of *Carthamus tinctorius* L. did not revealed any positive data.

V - Alpinia officinarum Hance :

(A) The light pet. extract of Alpinia officinarum Hance :

Discs prepared from light pet. extract of *Alpinia officinarum* Hance showed strong antibacterial activity on Staph. aureus but did not cause any inhibition zone in the other organisms (*Strept. faecalis, Ps. aeruginosa, Sal. typhimurium* and *E. coli*) table (6), photograph (12,13,14).

(B) The diethyl ether extract of Alpinia officinarum Hance :

Discs prepared from diethyl ether extract of *Alpinia officinarum* Hance showed strong antibacterial activity on *Staph. aureus* but did not cause any inhibition zone in the other tested organisms (*Strept. faecalis, E. coli, Ps. aeruginosa* and *Sal. typhimurium*) table (7), photograph (15).

(C) <u>The aqueous alcoholic extract of Alpinia officinarum Hance :</u>

Discs prepared from light aqueous alcoholic extract of *Alpinia officinarum* Hance showed antibacterial activity on *Staph. aureus,* but did not cause any inhibition zone in the other tested organisms (*Strept. faecalis, E. coli, Ps. aeruginosa* and *Sal. typhimurium*) table (8), photograph (16).

<u>Authentic antibiotic sensitivity discs :</u>

Inhibition zones caused by the authentic antibiotic sensitivity discs on Mueller Hinton plates inoculated with different organisms are recorded in table (9), photograph (12,13,14,15,17,18,19,20).

Nigella sativa L. :

(A) Light pet. extract of Nigella sativa L. :

Table (1) : Antibiogram of different concentration of light pet. extract of *Nigella sativa* L. against (5) types of microorganisms.

Disc content ug/disc.	Diameter of zone of inhibition (mm)				
	Staph. aureus	E. coli	Sal. typhimurium	Ps. aeruginosa	Strept. faecalis
800 µg/disc.	12 mm	-ve	-ve	-ve	-ve
400	10 mm	-ve	-ve	-ve	-ve
200	8 mm	-ve	-ve	-ve	-ve
100	-ve	-ve	-ve	-ve	-ve

Photograph 1 : Antibiogram of diffeent concentration of light pet. extract of *Nigella sativa* L. against *staph. aureus.*

* The light pet. extract caused inhibite growth of *staph. aureus* but did not cause inhibition of growth of other tested organisms.

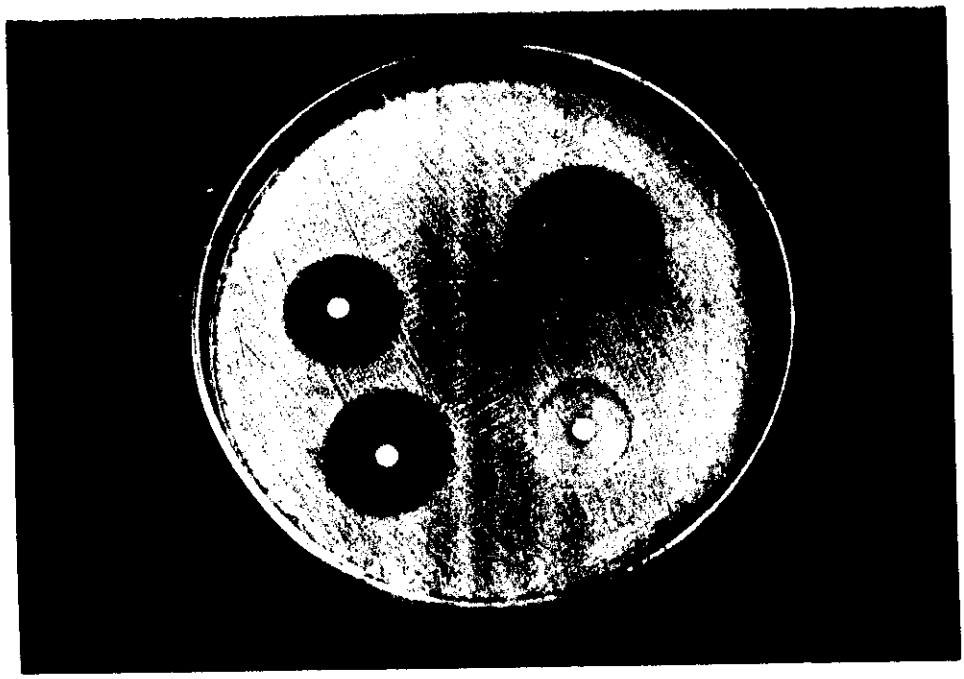
(B) Diethyl ether extract of Nigella sativa L. :

Table (2)

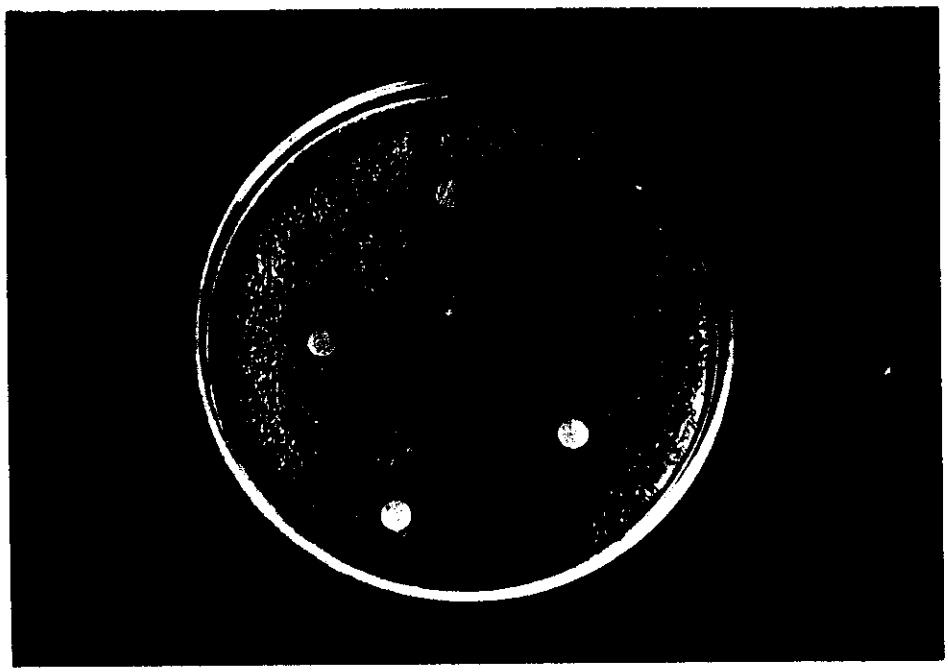
Antibiogram of different concentration of diethyl ether extract of *Nigella sativa* L. against (5) types of organisms.

Disc content ug/disc.	Diameter of zone of inhibition (mm)				
	Staph. aureus	E. coli	Sal. typhimurium	Ps. aeruginosa	Strept. faecalis
800 µg/disc.	38 mm	9 mm	12 mm	15 mm	40 mm
400	32 mm	8 mm	-ve	9 mm	28 mm
200	30 mm	6 mm	-ve	8 mm	26 mm
100	24 mm	-	-ve	7 mm	15 mm

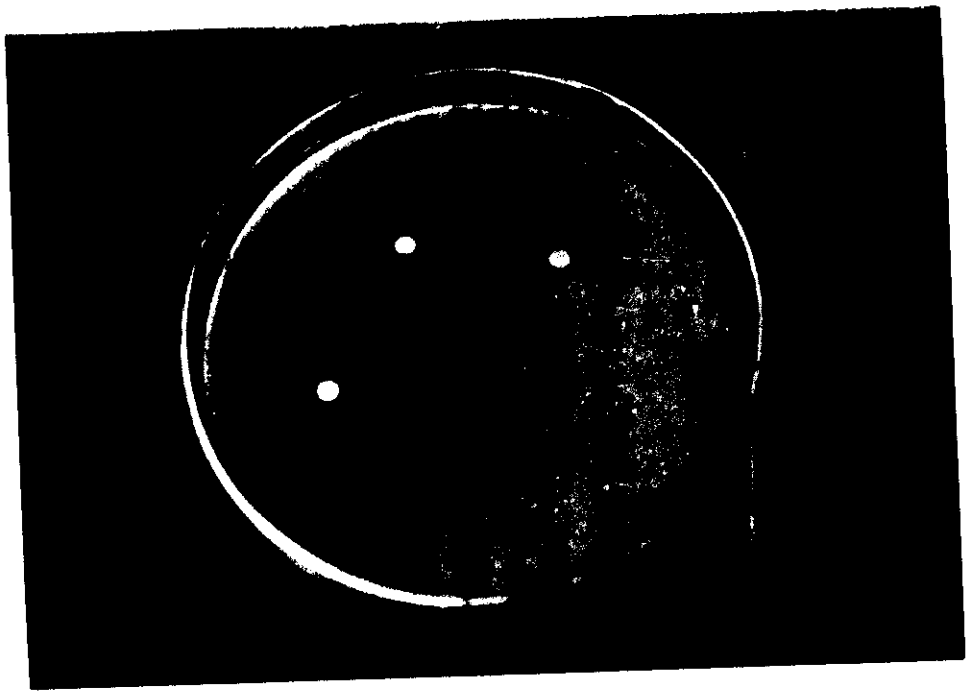
Photograph 2 : Antibiogram of different concentration of diethyl ether extract of *Nigella sativa* L. against *staph. aureus.*



Photograph 3 : Antibiogram of different concentration of diethyl ether extract of *Nigella sativa* L. against *Sal. typhimurium*



Photograph 4 : Antibiogram of different concentration of diethyl ether extract of *Nigella sativa* L. against *Strept. faecalis*



Photograph 5 : Antibiogram of different concentration of diethyl ether extract of *Nigella sativa* L. against *E. coli.*

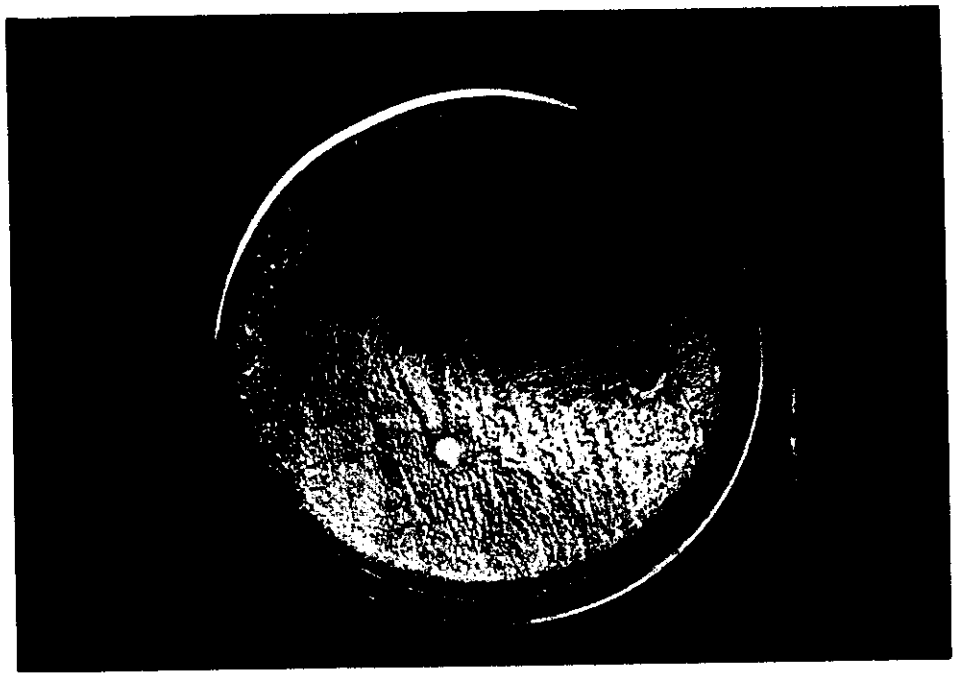
(C) Aqueous alcoholic extract of Nigella sativa L. :

Table (3)

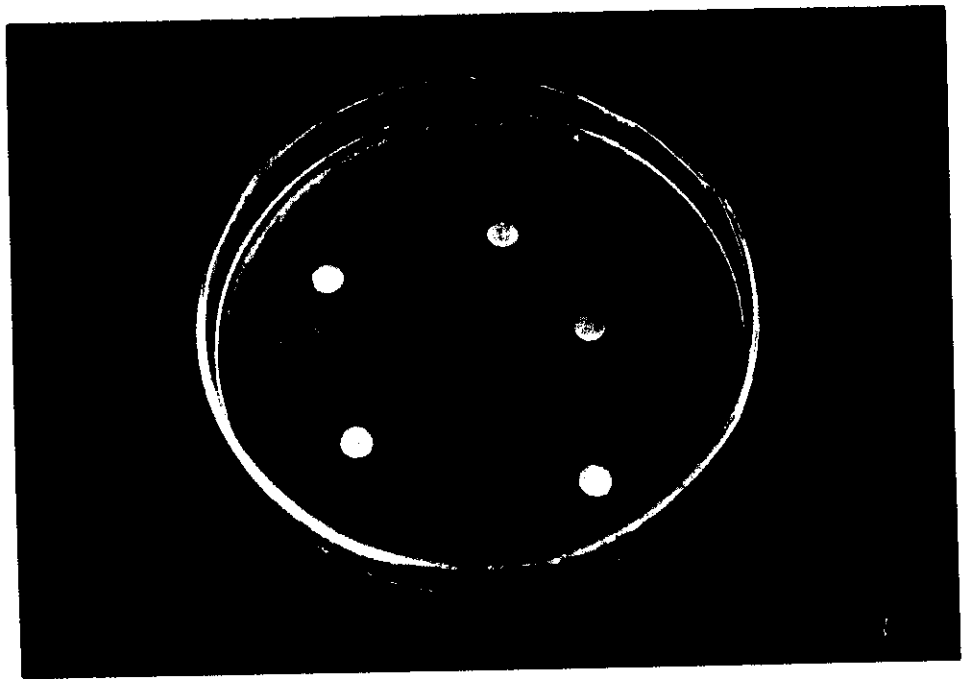
Antibiogram of different concentration of aqueous alcoholic extract of *Nigella sativa* L. against (5) types of microorganism.

Disc content ug/disc.	Diameter of zone of inhibition (mm)				
	Staph. aureus	E. coli	Sal. typhimurium	Ps. aeruginosa	Strept. faecalis
800 µg/disc.	38 mm	-ve	-ve	-ve	18 mm
400	25 mm	-ve	-ve	-ve	12 mm
200	21 mm	-ve	-ve	-ve	9 mm
100	9 mm	-ve	-ve	-ve	8 mm

Photograph 6 : Antibiogram of different concentration of aqueous alcoholic extract of *Nigella sativa* L. against *Staph. aureus.*



Photograph 7 : Antibiogram of different concentration of aqueous alcoholic extract of *Nigella sativa* L. against *Strept. faecalis.*



Peganum harmala L. :

Diethyl ether extract of Peganum harmala L. :

Table (4)

Antibiogram of different concentration of diethyl ether extract of *Peganum harmala* L. against (5) types of organisms.

Disc content ug/disc.	Diameter of zone of inhibition (mm)				
	Staph. aureus	E. coli	Sal. typhimurium	Ps. aeruginosa	Strept. faecalis
800 µg/disc.	10 mm	-ve	-ve	7 mm	11 mm
400	-ve	-ve	-ve	-ve	-ve
200	-ve	-ve	-ve	-ve	-ve
100	-ve	-ve	-ve	-ve	-ve

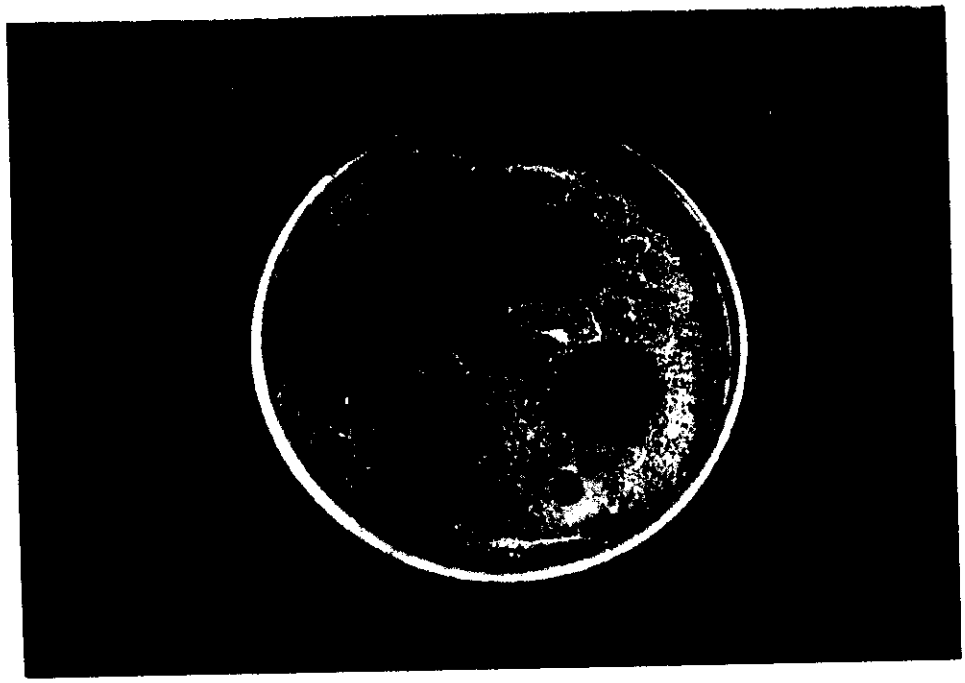
Aqueous alcoholic extract of Peganum harmala L. :

Table (5)

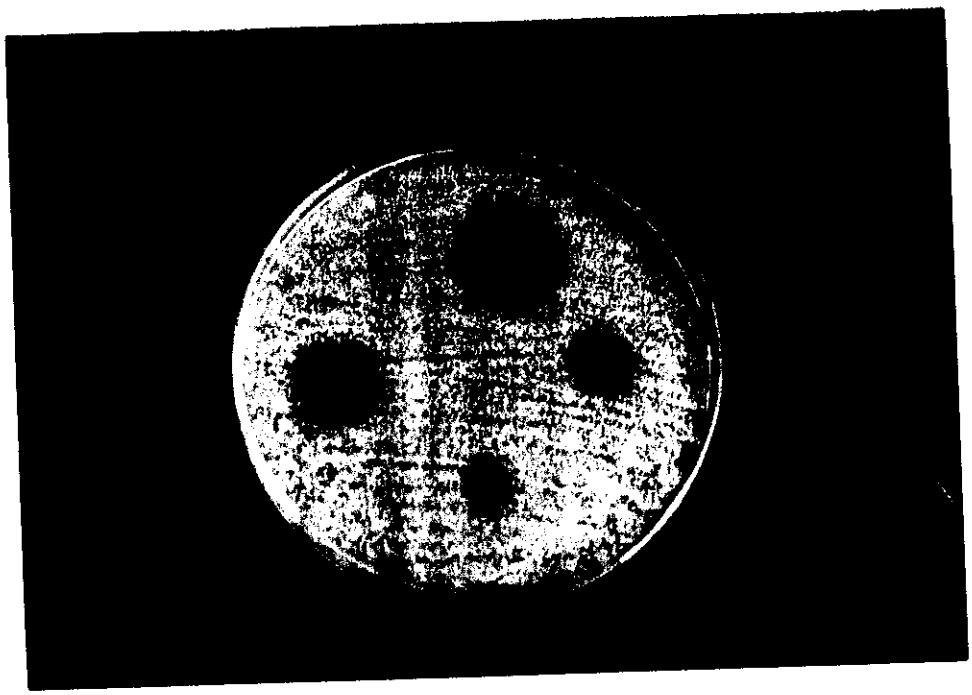
Antibiogram of different concentration of aqueous alcoholic extract of *Peganum harmala* L. against (5) types of organisms.

Disc content ug/disc.	Diameter of zone of inhibition (mm)				
	Staph. aureus	E. coli	Sal. typhimurium	Ps. aeruginosa	Strept. faecalis
800 µg/disc.	28 mm	18 mm	26 mm	-	20 mm
400	24 mm	15 mm	20 mm	-	15 mm
200	16 mm	13 mm	16 mm	-	14 mm
100	12 mm	7 mm	11 mm	-	8 mm

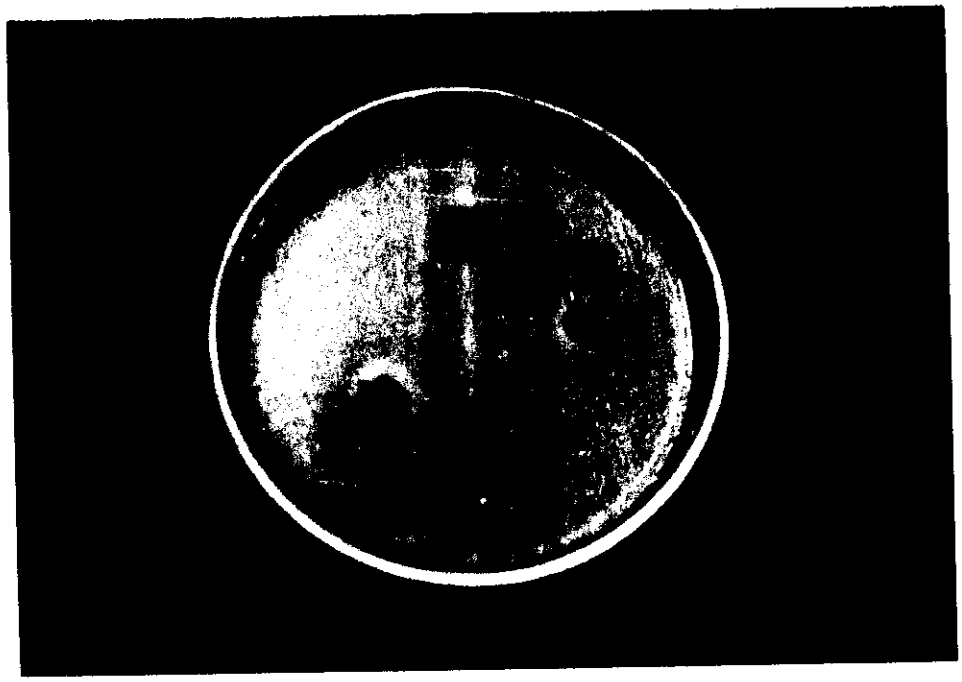
Photograph 8 : Antibiogram of diffeent concentration of aqueous alcoholic extract of *Peganum harmala* L. against *Staph. aureus*



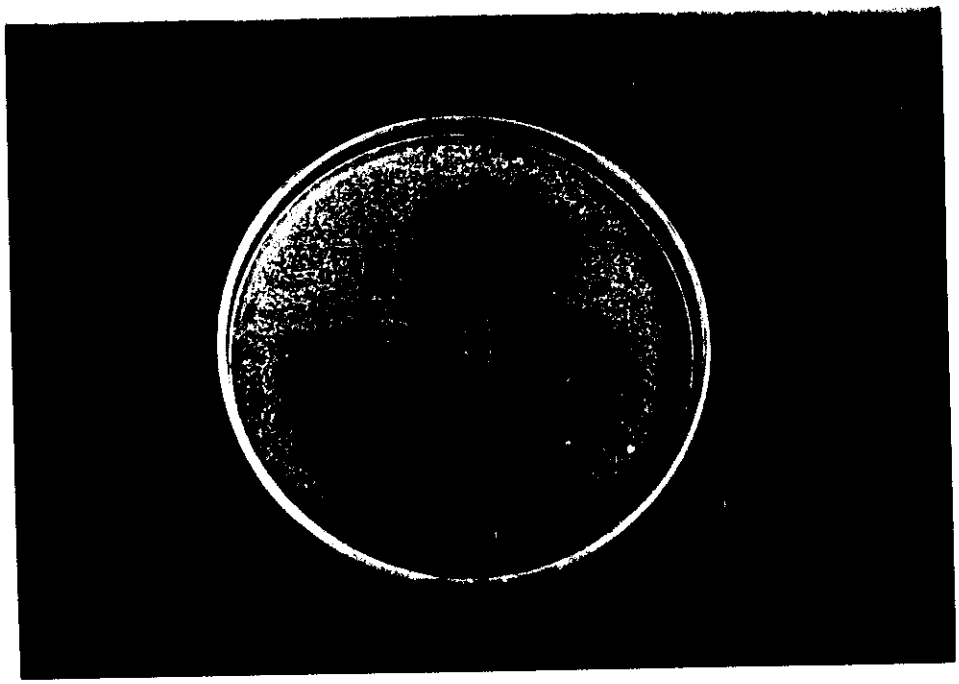
Photograph 9 : Antibiogram of different concentration of aqueous alcoholic extract of *Peganum harmala* L. against *Strept. faecalis*



Photograph 10 : Antibiogram of different concentration of aqueous alcoholic extract of *Peganum harmala* L. against *E. coli*



Photograph 11 : Antibiogram of different concentration of aqueous alcoholic extract of *Peganum harmala* L. against *Sal. typhimurium*



Alpinia officinarum Hance :

Light pet. extract of Alpinia officinarum Hance :

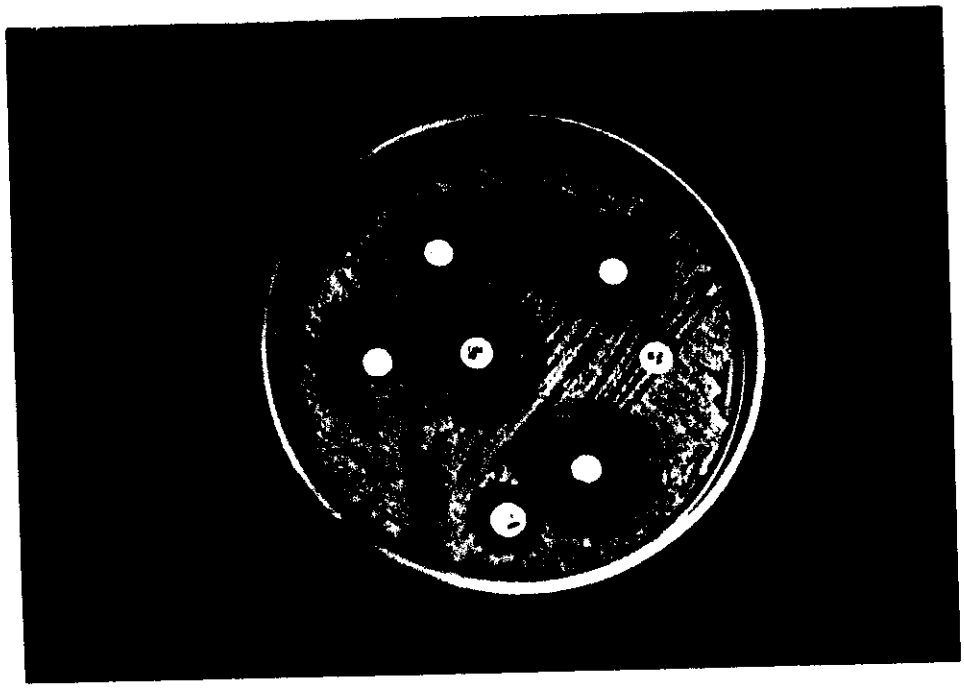
Table (6)

Antibiogram of different concentration of light pet. extract of *Alpinia officinarum* Hance against (5) types of organisms.

Disc content ug/disc.	Diameter of zone of inhibition (mm)				
	Staph. aureus	E. coli	Sal. typhimurium	Ps. aeruginosa	Strept. faecalis
800 µg/disc.	20 mm	-	-	-	-
400	17 mm	-	-	-	-
200	15 mm	-	-	-	-
100	11 mm	-	-	-	-

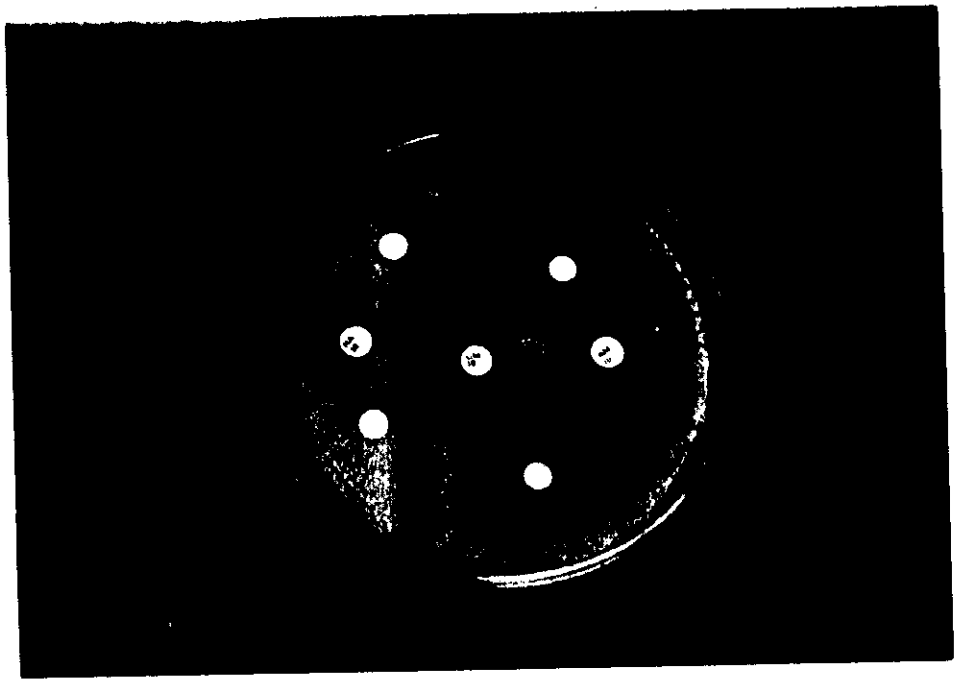
Disc prepared from light pet. extract of *Alpinia officinarum* Hance showed strong antibacterial activity on *Staph. aureus* but did not cause any inhibition zone in the other organisms *(Strept. faecalis, Ps. aeruginosa, Sal. typhimurium* and *E. coli).*

Photograph 12 : Antibiogram of different concentration of light pet. extract of *Alpinia officinarum* Hance against *Staph. aureus*, and antibiogram of Nalidixic acid and Ampicillin and Garamycin against *Staph. aureus*



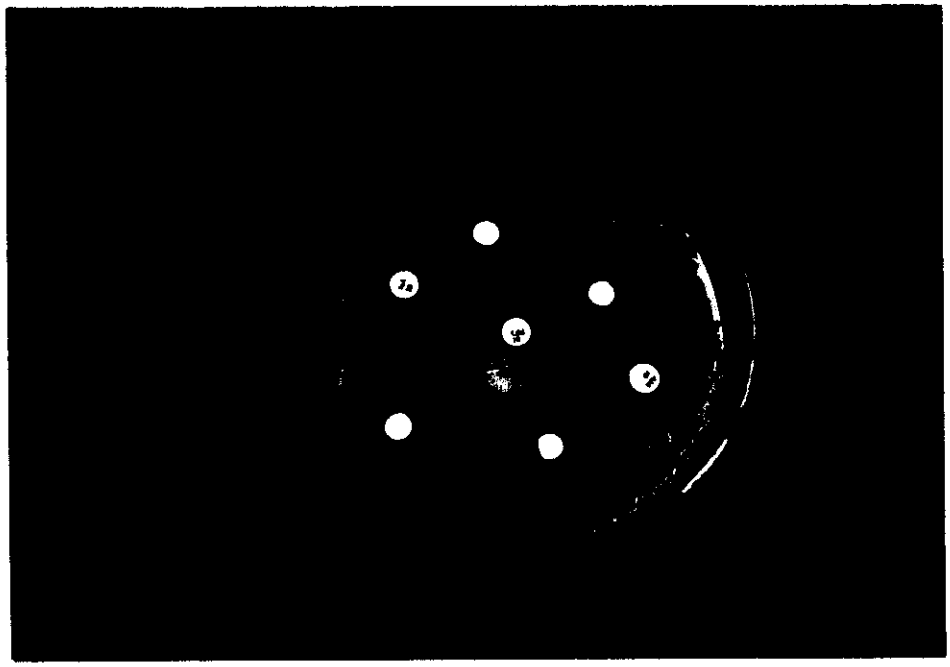
- inhibition zones of light pet. extract of *Alpinia officinarum* Hance on *Staph. aureus.*
- inhibition zones of Ampicillin and Garamycin.
- no inhibition zone of Nalidixic acid.

Photograph 13 : Antibiogram of Garamycin against Pseudomonas aeruginosa and antibiogram of different concentration of light pet. extract against *Ps. aeruginosa*



- no inhibition zones of light pet. extract of *Alpinia officinarum* Hance in case of *Ps. aeruginosa*
- inhibition zones of Garamycin

Photograph 14 : Antibiogram of different concentrations of light pet. extract of *Alpinia officinarum* Hance on *Sal. typhimurium* and antibiogram of Ampicillin, Nalidixic acid and Ampicillin against *Sal. typhimurium*



- no inhibition zones of light pet. extract of *Alpinia officinarum* Hance on Sal. typhimurium.
- inhibition zones of Ampicillin, Nalidixic acid and Ampicillin

Ethereal extract of Alpinia officinarium Hance :

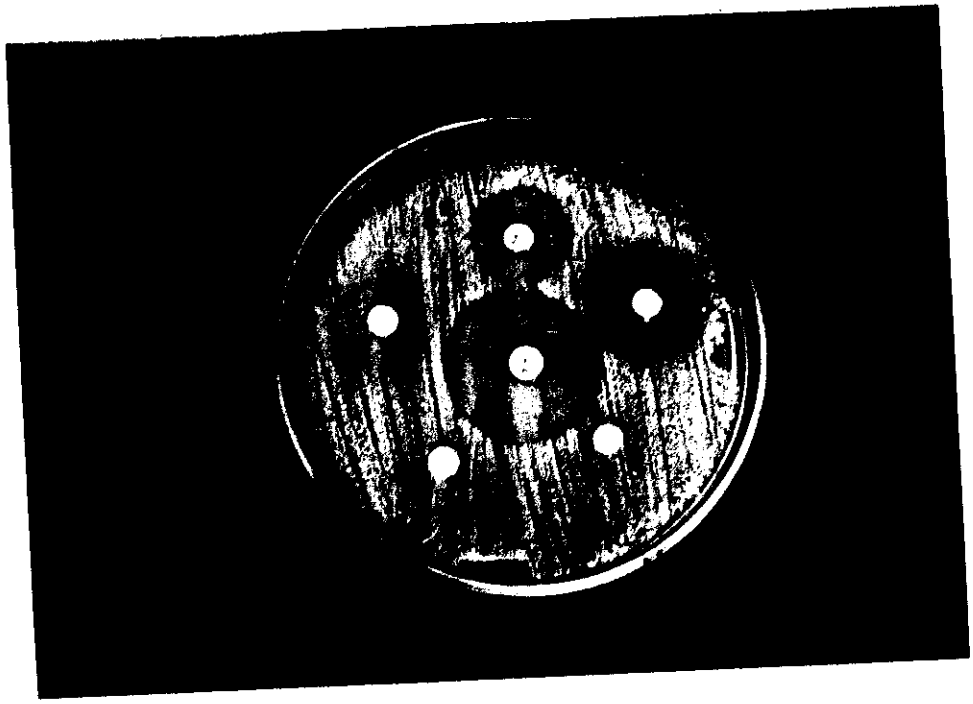
Table (7)

Antibiogram of different concentration of diethyl ether extract of *Alpinia officinarum* Hance against (5) types of organisms.

Disc content ug/disc.	Diameter of zone of inhibition (mm)				
	Staph. aureus	E. coli	Sal. typhimurium	Ps. aeruginosa	Strept. faecalis
800 µg/disc.	20 mm	-	-	-	-
400	18 mm	-	-	-	-
200	10 mm	-	-	-	-
100	-ve	-	-	-	-

Disc prepared from diethyl ether extract of *Alpinia officinarum* Hance showed strong antibacterial activity on *Staph. aureus* but did not cause any inhibition zone in the other tested organisms (*Strept. faecalis, E. coli, Ps. aeruginosa* and *Sal. typhimurium*).

Photograph 15 : Antibiogram of different concentrations of diethyl ether extract of *Alpinia officinarum* Hance against *Staph. aureus* and antibiogram of Cefadroxil and Cephapirin against *Staph.. aureus.*



- no inhibition zones of diethyl ether extract of *Alpinia officinarum* Hance on *Staph. aureus.*
- inhibition zones of Cefadroxil and Cephapirin.

N.B. :

2 discs of (100 µg/disc) of diethyl ether extract of *Alpinia officinarum* Hance against *Staph. aureus* appeared with no inhibition zone

aqueous alcoholic extract of Alpinia officinarum Hance :

Table (8)

Antibiogram of different concentration of aqueous alcoholic extract of *Alpinia officinarum* Hance against (5) types of organisms.

Disc content ug/disc.	Diameter of zone of inhibition (mm)				
	Staph. aureus	E. coli	Sal. typhimurium	Ps. aeruginosa	Strept. faecalis
800 µg/disc.	23 mm	-	-	-	-
400	18 mm	-	-	-	-
200	-	-	-	-	-
100	-	-	-	-	-

Disc prepared from aqueous alcoholic extract of *Alpinia officinarum* Hance showed antibacterial activity on *Staph. aureus* but did not cause any inhibition zone in the other tested organisms (*Strept. faecalis, E. coli, Ps. aeruginosa* and *Sal. typhimurium*).

Photograph 16 : Antibiogram of different concentrations of aqueous alcoholic extract of *Alpinia officinarum* Hance on *Staph. aureus.*

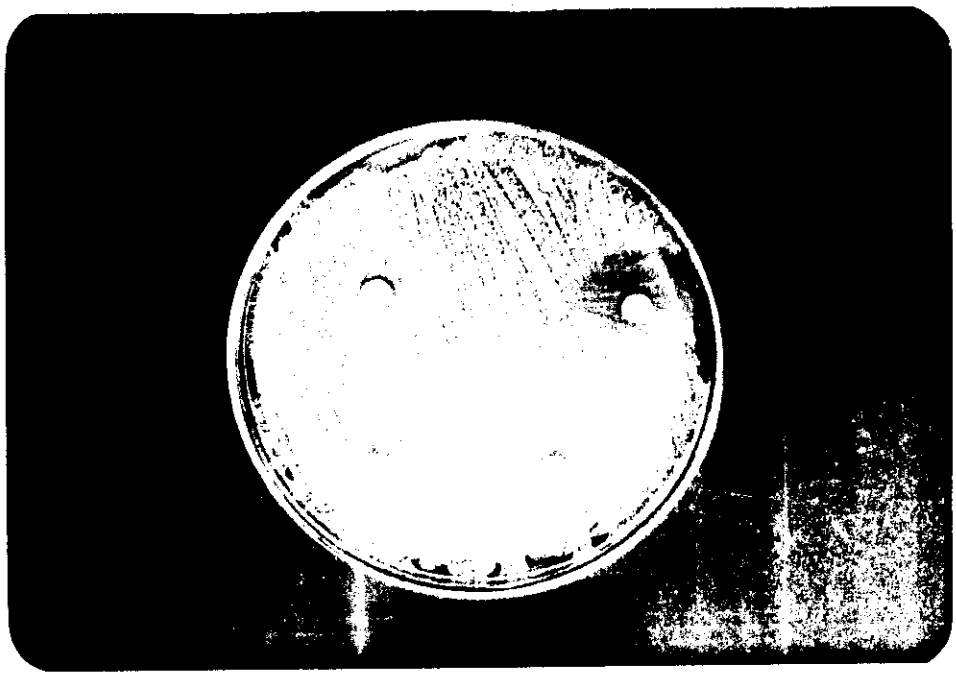
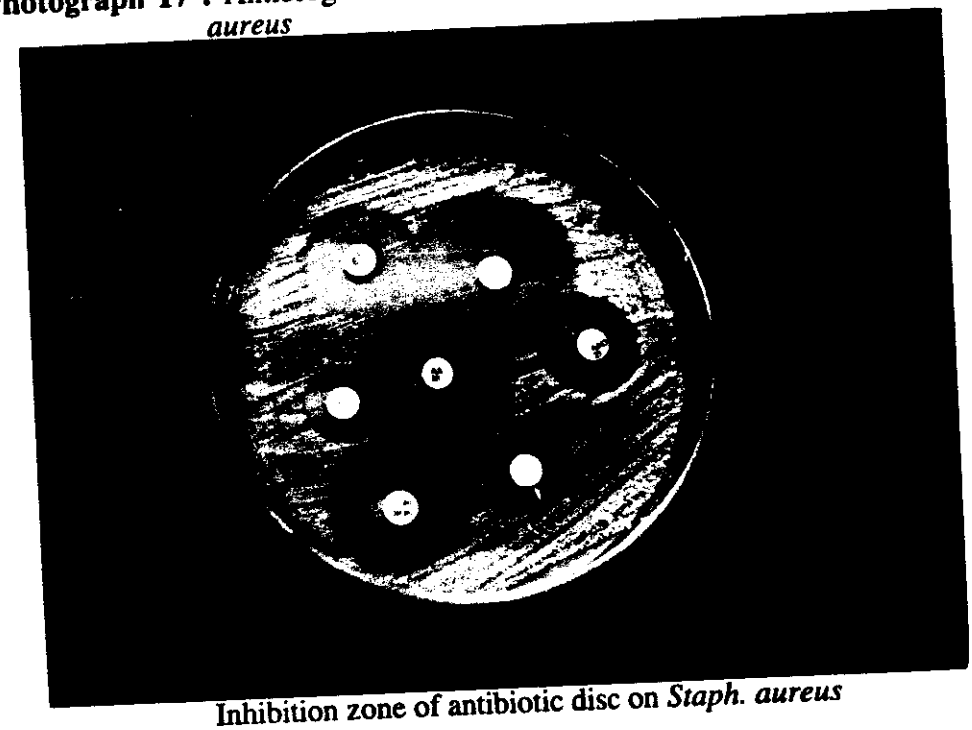


Table (9)

Diameter of inhibition zones (mm) caused by standard antibiotic sensitivity discs

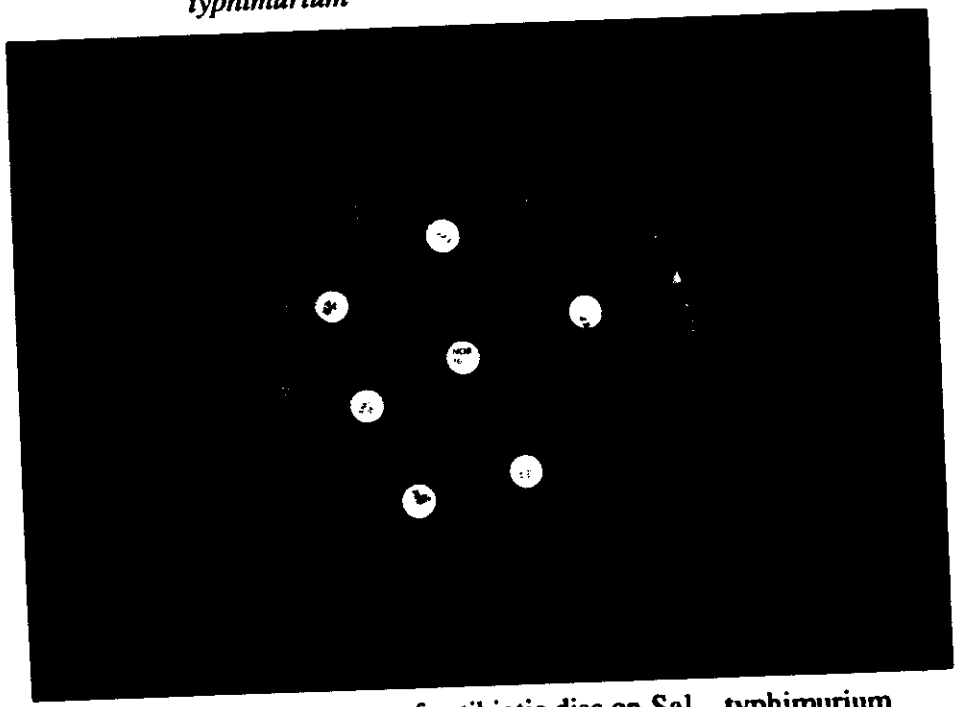
Antibiotic	Disc potency µg	Diameter of inhibition zones (mm)				
		Staph. aureus	Strept. faecalis	E. coli	Sal. typhi-murium	Ps. aeruginos
Cefadroxil	30 µg	18	-	18	15	-
Cephapirin	30 µg	30	-	-	24	-
Gentamicin	10 µg	24	15	25	25	22
Ampicillin	10 µg	13	32	-	22	-
Nalidixic acid	30 µg	-	-	8	11	-
Neomycin	30 µg	21	11	18	22	19
Ceftriazone	30 µg	15	-	26	26	-
Amoxycillin	25 µg	19	3	-	22	-
Amikin	30 µg	24	14	23	24	35
Norfloxacin	10 µg	24	18	27	3	28
Cefoperazone	75 µg	23	13	26	3	2
Chloromphanicol	30 µg	22	26	-	26	-
Sulphonamides	300 µg	-	-	-	-	-
Trimethoprim - sulphamethaxazole	1.75+ 23.75	32	31	22	32	16

Photograph 17 : Antibiogram of some authentic antibiotic disc against *Staph. aureus*



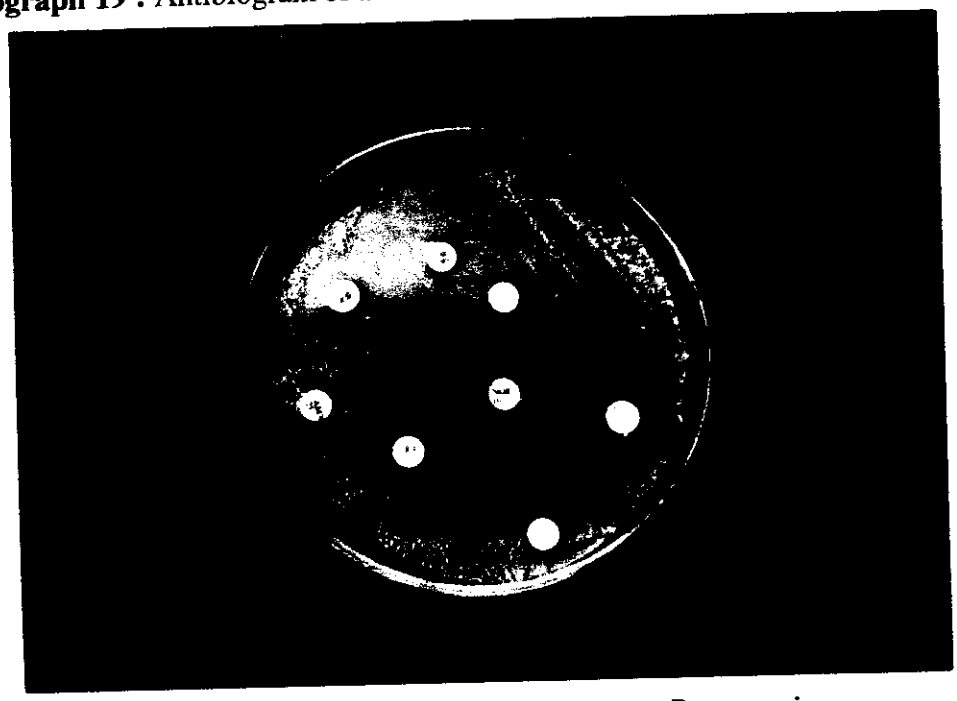
Inhibition zone of antibiotic disc on *Staph. aureus*

Photograph 18 : Antibiogram of some authentic antibiotic disc against *Sal. typhimurium*



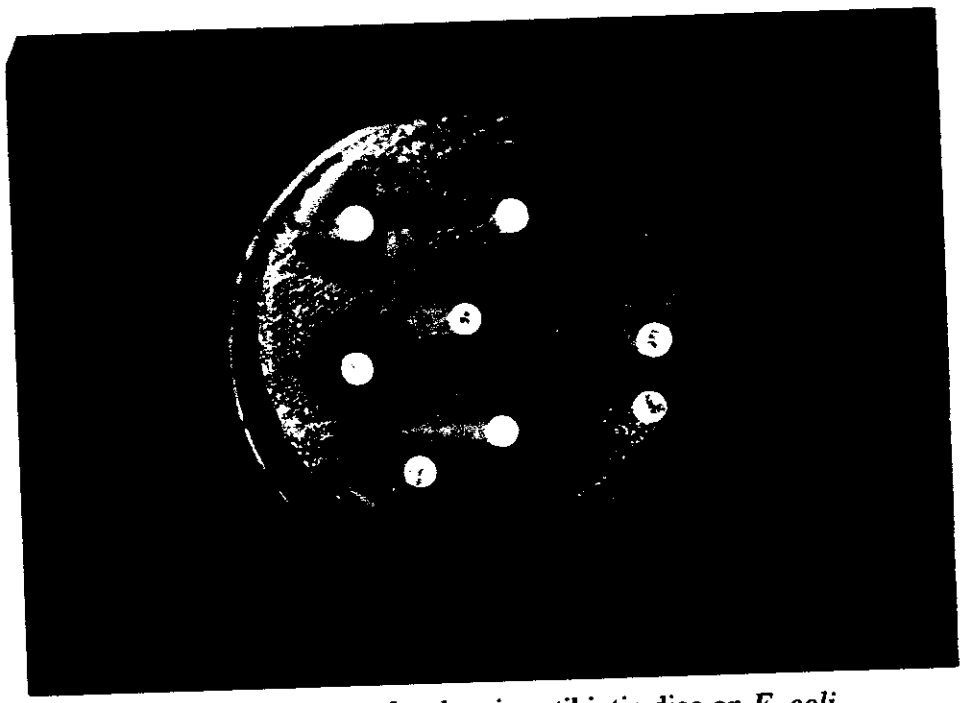
Inhibition zone of antibiotic disc on Sal. typhimurium.

Photograph 19 : Antibiogram of authentic antibiotic disc against *Ps. aeruginosa*



Inhibition zone of authentic antibiotic disc on *Ps. aeruginosa*

Photograph 20 : Antibiogram of authentic antibiotic disc against *E. coli*



Inhibition zone of authentic antibiotic disc on *E. coli.*

Interaction between different extracts of medicinal plants against some authentic used antibiotic disc

Table (10)

Interaction between ether extract of *Nigella sativa* L., aqueous alcoholic extract of *Peganum harmala* L. and light pet. extract of *Alpinia officinarum* Hance and some antibiotic drugs against *Staph. aureus.*

Antibiotic disc	Concentration of antibiotics disc	Ether extract of Nigella sativa L.	Alcoholic extract of Peganum harmala L.	Light pet. extract of Alpinia officinarum Hance
Norfloxacin	10 µg	A	A	A
Amikin	30 µg	S	A	A
Cefoperazone	75 µg	A	A	A
Gentamicin	10 µg	S	A	A
Ampicillin	10 µg	S	S	A
Trimethoprin - Sulphamethaxazole	1.75+23.75µg	A	A	A

S : Acts synergism
A : Acts additively

* Amikin, Gentamicin and Ampicillin acted synergistically with ether extract of *Nigella sativa* L., the other antibiotic discs acted additively with same extract.

* Ampicillin acted synergistically with aqueous alcoholic extract of *Peganum harmala* L., the other antibiotic acted additively with same extract.

* All antibiotic discs (Norfloxacin, Amikin and Cefoperazone Gentamicin, Ampicillin and trimethoprin-sulphamethaxazole) acted additively with light pet. extract of *Alpinia officinarum* Hance.

Table (11)

Interaction between ether extract of *Nigella sativa* L., aqueous alcoholic extract of *Peganum harmala* L. and some authentic antibiotic discs against *Strept. faecalis*

Antibiotic disc	Concentration of antibiotics disc	Ether extract of Nigella sativa L.	Alcoholic extract of Peganum harmala L.
Norfloxacin	10 µg	A	A
Amikin	30 µg	A	A
Cefoperazone	75 µg	A	A
Gentamicin	10 µg	A	A
Ampicillin	10 µg	A	A
Trimethoprim Sulphamethoxazole	1.75+23.75µg	A	A

A : Acts additively

* All tested antibiotic disc (Norfloxacin, Amikin, Cefoperazone, Gentamicin, Ampicillin, Trimethoprin-sulphamethoxazole) acted additively with ether extract of *Negilla sativa* L. and aqueous alcoholic extract of *Peganum harmala* L..

* Synergistic antibacterial action was not seen.

Table (12)

Interaction between ether extract of *Nigella sativa* L., aqueous alcoholic extract of *Peganum harmala* L. and some authentic antibiotic discs against *Ps. aeruginosa*

Antibiotic disc	Concentration of antibiotics disc	Ether extract of Nigella sativa L.	Alcoholic extract of Peganum harmala L.
Norfloxacin	10 µg	A	A
Amikin	30 µg	S	A
Cefoperazone	75 µg	A	A
Gentamicin	10 µg	S	A
Ampicillin	10 µg	S	A
Trimethoprim Sulphamethoxazole	1.75+23.75µg	A	A

A : Acts additively **S :** Acts synergism

* Amikin, Gentamicin and Ampicillin acted synergistically with ether extract of *Nigella sativa* L. and the other antibiotic discs acted additively with the same extract.

* All tested antibiotic discs (Norfloxacim, Amikin, Cefoperazone, Gentamicin, Ampicillin and Trimethoprin-sulphamethaxazole) acted additively with aqueous alcoholic extract of *Peganum harmala* L..

Table (13)

Interaction between ether extract of *Nigella sativa* L., aqueous alcoholic extract of *Peganum harmala* L. and some authentic antibiotic discs against *E. coli*

Antibiotic disc	Concentration of antibiotics disc	Ether extract of Nigella sativa L.	Alcoholic extract of Peganum harmala L.
Norfloxacin	10 µg	A	A
Amikin	30 µg	S	A
Cefoperazone	75 µg	A	A
Gentamicin	10 µg	S	A
Ampicillin	10 µg	S	A
Trimethoprim Sulphamethoxazole	1.75+23.75µg	A	A

A : Acts additively **S :** Acts synergism

* Amikin, Ampicillin acted synergistically with ether extract of *Nigella sativa* L. and the other antibiotic discs acted additively with same extract.

* All tested antibiotic discs (Norfloxacim, Amikin, Cefoperazone, Gentamicin, Ampicillin and Trimethoprin-sulphamethaxazole) acted additively with aqueous alcoholic extract of *Peganum harmala* L..

Table (14)

Interaction between ether extract of *Nigella sativa* L., aqueous alcoholic extract of *Peganum harmala* L. and some authentic antibiotic discs against *Sal. typhimurium*

Antibiotic disc	Concentration of antibiotics disc	Ether extract of Nigella sativa L.	Alcoholic extract of Peganum harmala L.
Norfloxacin	10 µg	A	A
Amikin	30 µg	S	A
Cefoperazone	75 µg	A	A
Gentamicin	10 µg	A	A
Ampicillin	10 µg	S	A
Trimethoprim Sulphamethoxazole	1.75+23.75µg	A	A

A : Acts additively **S :** Acts synergism

* Amikin, Ampicillin acted synergistically with ether extract of *Nigella sativa* L. and the other antibiotic discs acted additively with same extract.

* All tested antibiotic discs (Norfloxacim, Amikin, Cefoperazone, Gentamicin, Ampicillin and Trimethoprin-sulphamethoxazole) acted additively with aqueous alcoholic extract of *Peganum harmala* L..

Antibacterial effect of the boiling light pet. extract of Nigella sativa L.:

The boiling light pet. extract of *Nigella sativa* L. failed to inhibite growth of all tested organisms (*Staph. aureus, Sal. tymphimurium* and *Ps. aeruginosa*) at concentrations (400, 800, 1600, 3200 µg/disc)

Antibacterial effect of the boiling benzene extract of Nigella sativa L.:

* The boiling benzene extract of *Nigella sativa* L. failed to inhibite growth of all tested organisms (*Staph. aureus, Sal. typhimurium* and *Ps. aeruginosa*) at concentration (400, 800, 1600 µg/disc).
* The same extract at concentration 3200 µg/disc inhibite growth of *Staph. aureus, Sal. typhimurium* and *Ps. aeruginosa* and their diameter of inhibition zones (Cm) were (3.1 Cm, 1.2 Cm, 1.5 Cm) respectively.

Antibacterial effect of the boiling Alcoholic extract of Nigella sativa L. :

* The boiling alcoholic extract of *Nigella sativa* L. failed to inhibite growth of all tested organisms (*Staph. aureus, Sal. typhimurium* and *Ps. aeruginosa*) at concentration (400, 800, 1600 µg/disc).
* The same extract at concentration 3200 µg/disc inhibite growth of *Staph. aureus* and failed to inhibite growth of *Sal. typhimurium* zone of same extract against *Staph. aureus* was 2.5 Cm.

Antibacterial effect of the boiling aqueous extract of Nigella sativa L.:

The boiling aqueous extract of *Nigella sativa* L. failed to inhibite growth of all tested organisms (*Staph. aureus, Sal. typhimurium* and *Ps. aeruginosa*) at concentrations (400, 800, 1600, 3200 µg/disc).

DISCUSSION

The antibacterial activity of many medicinal plants was the aim of many research centre ***Toppozada et al. (1965); Namba et al. (1985); Saxena and Vyas (1986); Adaay et al. (1989); Akgull (1989); Alkofahi et al. (1990); Siddiqui et al. (1990) and Hanafy and Hatem (1991).*** The different medicinal plants we used in this study (*Nigella sativa* L., *Peganum harmala* L., *Ambrosia maritima* L., *Alpinia officinarum* Hance and *Carthamus tinctorius* L.) were selected because they are available in our country and some people used to treat themselves by these plants which prove to be effective.

The method of extraction of active principle of plant was the same as ***Alkofahi et al. (1990); Siddiqui et al. (1990); and Hanafy and Hatem (1991),*** this method was easy to be done in our laboratory.

The present study revealed that diethylether extract of *Nigella sativa* L. and Aqueous alcoholic extract of *Peganum harmala* L. (at concentration 100-800 ug/disc) inhibited the growth of several species of pathogenic bacteria as Gram positive (*Staph. aureus* and *Strept. faecalis*) and Gram negative bacteria as (E. coli, *Ps. aeruginosa* and *Sal. typhimurium*).

The antibacterial activity of *Nigella sativa* L. on all tested micro-organism except *Strept. faecalis* were similar with data of ***Hanafy and Hatem (1991). Saxena and Vyas (1986)*** studied the antibacterial activity of *Nigella sativa* L. on *Strept. faecalis* and *E. coli*, their data was similar with result of our study.

The present study revealed that the antibacterial activity of *Nigella sativa* L. on *E. coli*, *Ps. aeruginosa* and *Sal. typhymurium* were in contradiction with the data of ***Akgul (1989),*** who reported that *Nigella sativa* L. failed to inhibit the growth of these micro-organism. It should be also noted that he had also used ethanolic extract and the concentration of the extract was different. In addition the composition of oil used could be of important factor on this inhibitory action.

The activity of the diethyl ether extract of *Nigella sativa* L. was more active than the other extract (light pet. extract and the aqueous alcoholic extract) on the tested micro-organism whereas the aqueous alcoholic extract of *Peganum harmala* L. was more potent than other extracts(diethyl ether and light pet. extract). The present study also showed that light pet. extract of *Alpinia officinarium* Hance was more active than it's other extract on *Staph. aureus* only. The

same extract failed to inhibit the growth of the other micro-organism (*Sal. typhimurium, Strept. faecalis, Ps. aeruginosa,* and *E. coli* and these data of our study accepted with data of ***Ray and Majumdar (1975)*** who indicated that light pet. extract possessed strong activity against some pathogenic fungi.

Our results, demonstrated differences in the efficiency of organic solvent in extracting the antibacterial substances

(1) the diethylether extract was more effective in case of *Nigella sativa* L.
(2) the aqueous alcoholic extract was more effective in case of *Peganum harmala* L.
ether extract).
(3) the light pet. extract was more effective in case of *Alpinia officinarum* Hance

Different concentrations of aqueous alcoholic extract of *Peganum harmala* L. (100-800 ug/disc) had inhibitory effect on the all tested organism except *Ps. aeruginosa,* the extract of *Peganum harmala* L.

was activated at high concentrations. The result of our study were in accepted with data of ***(Adaay et al., 1989)*** who reported that *Peganum harmala* L. possess antibacterial activity against *E. coli, Staph. aureus, Ps. aeruginosa* and *Sal. typhimurium.*

Alkofahi et al. (1990) reported that the *Peganum harmala* L. possess antibacterial activity against *E. coli* and other micro-organism, they used dimethyl sulphoxide (DMSO) as solvent for extraction of antibacterial substances (harmaline) from *Peganum harmala* L.. The harmaline (active constituent of *Peganum harmala* L.) was more effective against *Strept. faecalis, E. coli, Sal. typhimurium* and *Sal. paratyphi* but *Ps. aeruginosa* and *Staph. aureus* were resistant.

Emboden (1979) stated that the crude preparation of the seed of *Peganum harmala* L. was more effective than any other extract because of the presence of related indoles. The antibacterial activity of ***Peganum harmala*** L. seeds reported by ***Al-Shamma and Mitscher (1979)*** was attributed to the presence of harmine,whereas ***Ross et al. (1980)*** stated that antibacterial activity of ethanolic extract of seed was due to harmaline and harmalol, that harmine showed no activity in this respect. ***Harsh and Nag (1984)*** concluded that the antibacterial activity of ether and ethanolic extract of *Peganum harmala* L. may due

to the presence of quercetin and or kaempferol.

It might be possible that antimicrobial activity of extract *P.harmala* L. is due to mutagenic effect of the extract on bacteria of *P. harmala* L. ***Alkofahi et al. (1990),*** this finding was confirmed in *Ambrosia maritima* L. by ***Alard et al. (1991)*** who reported that *Ambrosia maritima*L. has no mutagenic effect and in the present study we found *Ambrosia maritma* L. had no activity on any of tested organism.

In present study and based on the diameter of zone of inhibition produced by different extracts in plates inoculated with different types of organisms *Strept. faecalis* and *Staph aureus* were the most sensitive organism to *Nigella sativa* L. extract followed by *Ps. aeruginosa, Sal. typhimurium* and *E. coli.*

The inhibitory effect of *Peganum harmala* L. extract was more potent than that of the *Nigella sativa* L. in case of *Sal. typhimurium* and*E. coli*), Based on the wider zones of inhibition produced by discs of *Peganum harmala* L. extract compared with similar concentration of *Nigella sativa* L. extract.

The differences in the diameter of zones of inhibition may reflect differences in diffusion rates of different extracts in Mueller Hinton.

All extract of *Ambrosia maritima* L. failed to inhibit the growth of any tested organism. This result was due to might be that the concentration of extract are low or may be the plant has no any antibacterial substances.

All extracts of *Carthmus tinctorius* L. failed to inhibit growth of any tested organism, this demonstrated result might be due to using of seeds of plant, or may be the plant may have no any antibacterial substances.

Failure of boiled oil of *Nigella sativa* L. to show antibacterial activity may be due to thermal decomposition of antibacterial substances, this finding was observed by ***Hanafy and Hatem (1991) and Hanafy (1991)*** was reported that failure of garlic to show antibacterial activity was due to thermal decomposition of antibacterial substances. This garlic prepared by steam distillate which involves the use of superheated steam to rise the temperature of garlic to above 100°C to increase the yield of the steam distillable oil.

The diethyl ether of *Nigella sativa* L. extract showed antibacterial synergism with amikin and gentamycin and ampicillin in case of

Staph. aureus. Aqueous alcoholic extract of *Peganum harmala* L. showed antibacterial synergism with ampicillin.

Also diethyl ether extract of *Nigella sativa* L. showed antibacterial synergism with amikin, gentamycin, ampicillin in case of *Ps. aeruginosa* and showed antibacterial synergism with norfloxacin, amikin, gentamycin, ampicillin in case of *E. coli* and showed antibacterial synergism with amikin, ampicillin in case of *Sal. typhimurium.* These findings suggest that preparations from these plants, if given with antibacterial drugs would enhance their efficacy. The results of the present study coincided with the result of ***Hanafy and Hatem(1991)*** who reported that diethyl ether extract of *N. sativa* L. showed antibacterial synergism with streptomycin and gentamycin in case of *E. coli, Strept. faecalis* and *Ps. aeruginosa.*