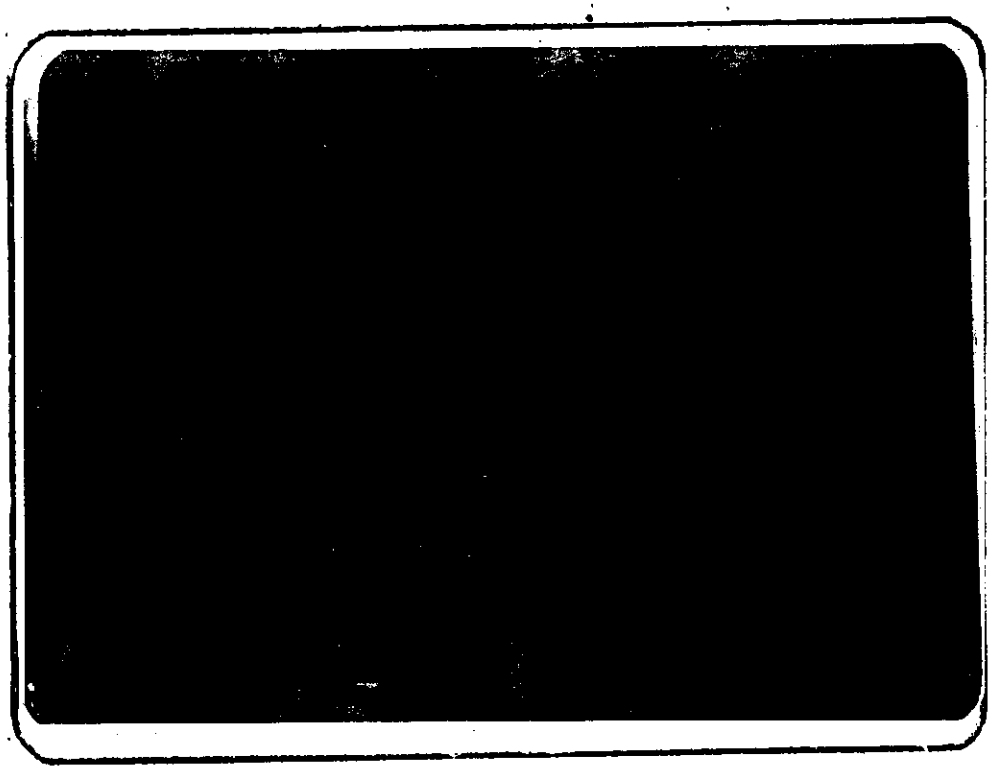


Fig (21) : Microphotograph of spore chains of isolate No. T (X 400).

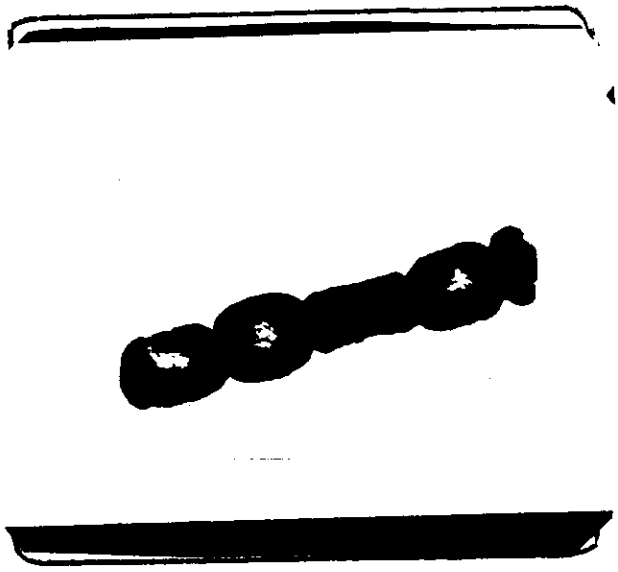


Fig (22) : Electron micrograph of spores of isolate No. T (X 20000).

Table (55): Morphological and cultural charateristics of isolates No5, A and T.

character	isolates Nos.	
	A	T
spore chain morphology		
rectiflexibiles	1	1
rectinaculiaperti	0	0
spirales	0	0
verticillate	0	0
short tufts	1	1
spore chain ornamentation		
smooth	1	1
warty	0	0
spiny	0	0
hairy	0	0
rugose	0	0
production of aerial spore mass	1	1
colour of aerial spore mass		
red	1	1
yellow	0	0
grey	0	0
green	0	0
blue	0	0
violet	0	0
white	0	0
no distinctive substrate mycelial pigment	1	1
melanin production on:		
peptone-yeast-iron agar	1	1
tyrosine agar	1	1
fragmentation of mycelium	0	0
sclerotia formation	0	0
sporulation of substrate mycelium	0	0

CULTURAL CHARACTERISTICS

The cultural characteristics of isolates of the present group showed that these organisms, when cultivated on starch nitrate agar, glycerol nitrate agar, yeast malt extract agar, oat meal agar, glycerol asparagine agar, or fish meal extract agar, gave good growth with light yellowish pink in colour aerial mycelium with nonpigmented substrate mycelium. All media remained nonpigmented Table (56)'

Melanin pigment production:

Isolates of the present group succeeded to produce melanin pigments, when cultivated on either peptone yeast-iron agar, or tyrosine agar Table (55)'

Table (56): Cultural characteristies of 14 days old cultures of isolates Nos. A and T on different agar media.

	colour of		
medium	aer. mycelium	substrate mycelium	medium
starch nitrate agar	light yellowish pink	nonpigmented	nonpigmented
glycerol nitrate agar	light yellowish pink	nonpigmented	nonpigmented
yeast malt extract agar	light yellowish pink	nonpigmented	nonpigmented
oat meal agar	light yellowish pink	nonpigmented	nonpigmented
glycerol asparagine agar	light yellowish pink	nonpigmented	nonpigmented
fish meal extract agar	light yellowish pink	nonpigmented	nonpigmented

GROWTH CHARACTERISTICS

Growth at different incubation temperature and pH

The optimum growth temperature of isolates of the present group was found to be 28 °C, they gave weak growth at 10 °C, but no growth at 45 °C or 52 °C which indicates that these isolates are true mesophiles. Isolates failed to give any growth at pH 4.3, but gave very good growth at pH 7.0 Table (57)

Table (57): Growth of isolates Nos. A and T at different temperature pH and in presence of some inhibitors.

growth inhibitors		isolates Nos. A	isolates Nos. T
temeratures			
4 C°		0	0
10 C°		1	1
28 C°		1	1
45 C°		0	0
52 C°		0	0
pH			
4.3		0	0
7.0		1	1
growth inhibitors:			
NaCl 0 %		1	1
0.5%		1	1
4%		0	0
7%		0	0
10%		0	0
13%		1	1
sod. azide	0.01%	1	1
sod. azide	0.02%	1	1
phenol	0.1 %	0	0
potassium tellurite	0.001%	1	1
potassium tellurite	0.01%	1	1
thallous acetate	0.001%	1	1
thallous acetate	0.01%	1	1
crystal violet	0.0001%	1	1

Growth in presence of some inhibitors

Isolates of the present group were found to tolerate NaCl concentrations up to 4% showing intense growth at 0.5% NaCl (Table 3). Growth of isolates of this group was inhibited by 0.1% phenol but was not affected by 0.01% or 0.02 % sodium azide, 0.001% or 0.01% potassium tellurite, 0.001%, 0.01% thallous acetate or 0.0001% crystal violet Table (57).

Growth on sole carbon sources

Isolates of the present group succeeded to assimilate L-arabinose, sucrose, meso-inositol, mannitol, D-fructose, L-rhamnose, raffinose, mannose, lactose, inulin, D-galactose, cellobiose, sodium acetate, sodium citrate, sodium pyruvate, ammonium tartarate, but failed to assimilate D-xylose, salicin, trehalose, dextran or sodium oxalate Table (58).

Growth on sole nitrogen sources

Isolates of the present group were found to utilize potassium nitrate, L-cysteine, L-valine, L-threonine, L-serine, L-histidine, L-arginine, hydroxyproline, alanine, glycine, leucine, cystine, glutamine, tyrosine but did not utilize α-amino butyric acid, L-phenylalanine, tryptophane or aspartic acid Table (59).

Table (58): Growth of isolates No. A and T on sole carbon sources.

carbon source	isolates Nos.	
	A	T
L-arabinose	1	1
sucrose	1	1
D-xylose	0	0
meso-inositol	1	1
mannitol	1	1
D-fructose	1	1
L-rhamnose	1	1
raffinose	1	1
mannose	1	1
lactose	1	1
inuline	1	1
salicin	0	0
trehalose	0	0
dextran	0	0
D-galactose	1	1
cellobiose	1	1
sodium acetate	1	1
sodium citrate	1	1
sodium pyruvate	1	1
sodium oxalate	0	0
ammonium tartarate	1	1

Table (59): Growth of isolates No. A and T on sole nitrogen sources.

nitrogen source	isolates Nos.	
	A	T
α-amino butyric acid	0	0
potassium nitrate	1	1
L-cysteine	1	1
L-valine	1	1
L-threonine	1	1
L-serine	1	1
L-phenylalanine	0	0
L-methionine	1	1
L-histidine	1	1
L-arginine	1	1
L-hydroxyproline	1	1
tryptophan	0	0
alanine	1	1
glycine	1	1
leucine	1	1
cystine	1	1
glutamine	1	1
aspartic acid	0	0
tyrosine	0	1

ANTIMICROBIAL POTENTIALITIES

The antimicrobial potentialities of isolates of this group, when cultivated on starch nitrate agar or fish meal extract agar showed that the studied isolates succeeded to produce antimicrobial substances, that inhibited the growth of Bacillus cereus, Fusarium oxysporum but failed to produce antimicrobial substances aganist Escherichia coli, Pseudomonas fluorescens, Candida albicans, Saccharomyces cerevisiae or Macrophomina phaseoli. (Table 60)

Table (60): Antimicrobial potentialities of isolates Nos. A and T.

media	isolates Nos.	test organism: E. coli	Ps. fluorescens	B. subtilis	B. cereus	Ca. albicans	Sach. cerevisiae	F. oxysporum	Ma. phaseoli
starch nitrate agar	A	0	0	17	21	14	14	0	0
	T	0	0	18	22	14	14	0	0
fish extract agar	A	0	0	27	22	19	23	0	0
	T	0	0	27	22	20	24	0	0

* figures indicate width of zones of inhibition in mm.

SENSITIVITY TO DIFFERENT ANTIBIOTICS

Isolates of this group were found to be resistant to the inhibitory effect of tobramycin, caphaloridine, vancomycin and pencillin G but sensitive to gentamicin, neomycin, streptpmycin, rifampicin, dimethychlortetracyline, oleandomycin and lincomycin Table (61)*

Table (61): Sensitivity of isolates No. A and T to different antibiotics (ug ml^{-1}).

antibiotic		isolates Nos. A	isolates Nos. T
gentamicin	(100)	7	12
neomycin	(50)	12	11
streptomycin	(100)	22	25
tobramycin	(50)	0	0
rifampicin	(50)	20	30
cephaloridine	(100)	0	0
vancomycin	(100)	0	0
dimethylchlortetracycline	(500)	11	30
oleandomycin	(100)	5	8
lincomycin	(100)	28	12
penicillin G	(10 i.u)	0	0

* figures indicate width of zones of inhibition in mm.

SOME ENZYMATIC ACTIVITIES

Isolates of this group exhibited well expressed lipolytic, keratinolytic, cellulolytic, pectinolytic and chitinolytic activities, reduced nitrates to nitrites and produced hydrogen sulphide but failed to coagulate or peptonize milk Table(62).

Table(62): Some enzymatic activities of isolates No. A and T.

enzymatic activities	isolates Nos.	
	A	T
lipolytic	1	1
keratinolytic	1	1
cellulolytic	1	1
pectinolytic	1	1
chitinolytic	1	1
nitrate reduction	1	1
production of H_2S	1	1
coagulation & peptonization of milk	0	0

DEGRADATIVE POTENTIALITIES OF SOME COMPLEX COMPOUNDS

Isolates of this group succeeded to degrade elastine, tyrosine, adenine, DNA, RNA, Tween 80, strach, casein, gelatine, aesculine, arbutin, glycogen, chitin and keratin but failed to degrade, hypoxanthine, guanine, xylan, testesterone or urea Table (63).

Table (63): Degradative potentialies of some complex compounds of isolates Nos. A and T.

complex compound	isolates Nos.	
	A	T
hypoxanthine	0	0
guanine	0	0
elastine	1	1
tyrosine	1	1
adenine	1	1
DNA	1	1
RNA	1	1
tween 80	1	1
starch	1	1
xylan	0	0
casein	1	1
testesterone	0	0
urea	0	0
gelatin	1	1
aesculin	1	1
arbutin	1	1
glycogen	1	1
chitin (wool)	1	1
keratin (feather)	0	0

TAXONOMIC IDENTIFICATION OF ISOLATES OF GROUP SEVEN

On the basis of the characteristics obtained for isolates of this group they were identified as Streptomyces gilvus (Krassilnikov, 1970).

GROUP EIGHT

This group includes 27 isolates Nos. 2, 4, 17, 18, 22, 21, 2I,32, 38, 42, 48, 71, 232, 356, 360, 381, 414, 428, 16-D, 20-55, 22-D, 27-D, 22-36, 2F and 20-1. Of these isolates Nos. 20-55 and 48 were considered representative ones.

MORPHOLOGICAL CHARACTERISTICS

Spore chain morphology

The microscopic examination of the aerial growth of the experimented isolates of the present group in streak cultures revealed that they produce long straight to slightly flexuous chains of spores. Chains are usually in characteristic tufts (Fig.23).

Spore morphology and ornamentation

The electron microscopic examination of cultures of the isolates of the present group revealed that they produce long cylinderical spores with attenuated ends. Spore surface is smooth (Fig.24).

Fig (23) : Microphotograph of spore chains of isolate No.48 (X 400).

Fig (24) : Electron micrograph of spores of isolate No.48 (X25000).

Table (64): Morphological and cultural charateristics of isolates No. 20-55 and 48.

character	isolates Nos. 20-55	48
spore chain morphology		
rectiflexibiles	1	1
rectinaculiaperti	0	0
spirales	0	0
verticillate	0	0
long tuft$	1	1
spore chain ornamentation		
smooth	1	1
warty	0	0
spiny	0	0
hairy	0	0
rugose	0	0
production of aerial spore mass	1	1
colour of aerial spore mass		
red	1	1
yellow	0	0
grey	0	0
green	0	0
blue	0	0
violet	0	0
white	0	0
no distinctive substrate mycelial pigment	1	1
melanin production on:		
peptone-yeast-iron agar	0	0
tyrosine agar	0	0
fragmentation of mycelium	0	0
sclerotia formation	0	0
sporulation of substrate mycelium	0	0

CULTURAL CHARACTERISTICS

The cultural characteristics of the isolates of the present group when cultivated on starch nitrate agar, glycerol nitrate agar, yeast malt extract agar, oat meal agar, glycerol asparagine agar, or fish meal extract agar, gave good growth with light yellowish pink in colour aerial mycelium and nonpigmented substrate mycelium. All used media remained nonpigmented Table (65).

Melanin pigment production

Isolates of this group failed to produce melanin pigments, when cultivated on either peptone yeast-iron agar, or tyrosine agar Table (64).

Table (65): Cultural characteristies of 14 days old cultures of isolates Nos. 20-55 and 48 on different agar media.

	colour of		
medium	aer. mycelium	substrate mycelium	medium
starch nitrate agar	light yellowish pink	nonpigmented	nonpigmented
glycerol nitrate agar	light yellowish pink	nonpigmented	nonpigmented
yeast malt extract agar	light yellowish pink	nonpigmented	nonpigmented
oat meal agar	light yellowish pink	nonpigmented	nonpigmented
glycerol asparagine agar	light yellowish pink	nonpigmented	nonpigmented
fish meal extract agar	light yellowish pink	nonpigmented	nonpigmented

GROWTH CHARACTERISTICS

Growth at different incubation temperatures and pH

The optimum growth temperature of isolates of this group was found to be 28 °C. Isolates gave weak growth at 10 °C, but no growth at 45 °C or 52 °C, which indicates that these isolates are true mesophiles. Isolates failed to give any growth at pH 4.3 but gave good growth at pH 7.0 Table (66).

Table (66): Growth of isolates Nos. 20–55 and 48 at different temperatures pH and in presence of some inhibitors.

growth inhibitors		isolates Nos. 20–55	isolates Nos. 48
temeratures			
4 C°		0	0
10 C°		1	1
28 C°		1	1
45 C°		0	0
52 C°		0	0
pH			
4.3		0	0
7.0		1	1
growth inhibitors:			
NaCl 0 %		1	1
0.5%		1	1
4%		0	0
7%		0	0
10%		0	0
13%		0	0
sod. azide	0.01%	0	0
sod. azide	0.02%	0	0
phenol	0.1 %	0	0
potassium tellurite	0.001%	1	1
potassium tellurite	0.01%	0	0
thallous acetate	0.001%	1	1
thallous acetate	0.01%	1	1
crystal violet	0.0001%	1	1

Growth in presence of some inhibitors

Isolates of this group were found to tolerate NaCl concentrations up to 4%, showing intense growth at 0.5% NaCl (Table 3). Growth of isolates of this group was inhibited by 0.01% or 0.02% sodium azide, 0.01% potassium tellurite, 0.1% phenol, but was not affected by 0.001% potassium tellurite, 0.001% or 0.01% thallous acetate or 0.0001% crystal violet Table (66).

Growth on sole carbon sources

Isolates of this group succeeded to assimilate L-arabinose, sucrose, meso-inositol, monnitol, D-fructose, L-rhamnose, raffinose, mannose, lactose, inuline, trehalose, D-galactose, cellobiose, sodium acetate, sodium citrate, ammonium tartarate, but failed to assimilate D-xylose, salicin, dextran, sodium pyruvate or sodium oxalate Table (67).

Growth on sole nitrogen sources

Isolates of the present group were found to utilize -α amino butyric acid, potassium nitrate, L-cysteine, L-valine, L-threonine, L-serine, L-histidine, L-hydroxyproline, glycine, cystine, glutamine, aspartic acid but did not utilize L-phenylalanine, L-arginine, tryptophan, alanine, leucine or tyrosine Table (68).

Table (67): Growth of isolates No. 20-55 and 48 on sole carbon sources.

carbon source	isolates Nos.	
	20-55	48
L-arabinose	1	1
sucrose	1	1
D-xylose	0	0
meso-inositol	1	1
mannitol	1	1
D-fructose	1	1
L-rhamnose	1	1
raffinose	1	1
mannose	1	1
lactose	1	1
inuline	1	1
salicin	0	0
trehalose	0	0
dextran	1	0
D-galactose	1	1
cellobiose	1	1
sodium acetate	1	1
sodium citrate	1	1
sodium pyruvate	0	0
sodium oxalate	0	0
ammonium tartarate	1	1

Table (68): Growth of isolates No. 20-55 and 48 on sole nitrogen sources.

nitrogen source	isolates Nos.	
	20-55	48
∝-amino butyric acid	1	1
potassium nitrate	1	1
L-cysteine	1	1
L-valine	1	1
L-threonine	1	1
L-serine	1	1
L-phenylalanine	0	0
L-histidine	1	1
L-arginine	0	0
L-hydroxyproline	1	1
tryptophan	0	0
alanine	0	0
glycine	1	1
leucine	0	0
cystine	1	1
glutamine	1	1
aspartic acid	1	1
tyrosine	0	0

ANTIMICROBIAL POTENTIALITIES

The study of the antimicrobial potentialities of isolates of this group, when cultivated on starch nitrate agar or fish meal extract agar, showed that the studied isolates weakly produced antimicrobial substances, that weakly inhibited the growth of Bacillus cereus, Bacillus subtilis, and Macrophomina phaseoli. This means that isolates of this group weakly produce antibiotic substance, effective against some Gram positive acteria and weakly affected Macrophomina phaseoli Table (69)*

Table (69): Antimicrobial potentialities of isolates Nos. 20-55 and 48.

media	isolates Nos.	test organism							
		E. coli	Ps. fluorescens	B. subtilis	B. cereus	Ca. albicans	Sach. cerevisiae	F. oxysporum	Ma. phaseoli
starch nitrate agar	20-55	0	0	9	13	0	0	0	14
	48	0	0	8	12	0	0	0	9
fish extract agar	20-55	0	0	4	10	0	0	0	11
	48	0	0	12	0	0	0	0	6

* figures indicate width of zones of inhibition in mm.

SENSITIVITY TO DIFFERENT ANTIBIOTICS

Isolates of this group were found to be resistant to the inhibitory effect of cephaloridine, vancomycin, dimethylchlortetracyline, lincomycin, pencillin G but sensitive to gentamicin, neomycin, streptpmycin, tobramycin, rifampicin, and oleandomycin Table (70).

Table (70): Sensitivity of isolates No. 20-55 and 48 to different antibiotics (ug ml^{-1}).

antibiotic		isolates Nos. 20-55	48
gentamicin	(100)	20	20
neomycin	(50)	10	12
streptomycin	(100)	24	22
tobramycin	(50)	12	13
rifampicin	(50)	10	5
cephaloridine	(100)	0	0
vancomycin	(100)	0	0
dimethylchlortetracycline	(500)	0	0
oleandomycin	(100)	12	10
lincomycin	(100)	0	0
penicillin G	(10 i.u)	0	0

* figures indicate width of zones of inhibition in mm.

SOME ENZYMATIC ACTIVITIES

Isolates of this group exhibited well expressed lipolytic, keratinolytic, cellulolytic, pectinolytic and chitinolytic activities, reduced nitrates to nitrites, produced hydrogen sulphide and coagulated and peptonized milk Table (71).

Table (71): Some enzymatic activities of isolates No. 20-55 and 48.

enzymatic activities	isolates Nos.	
	20-55	48
lipolytic	1	1
keratinolytic	1	1
cellulolytic	1	1
pectinolytic	1	1
chitinolytic	1	1
nitrate reduction	1	1
production of H_2S	1	1
coagulation & peptonization of milk	1	1

DEGRADATIVE POTENTIALITIES OF SOME COMPLEX COMPOUNDS

Isolates of this group succeeded to degrade hypoxanthine, adenine, DNA, RNA, tween 80, strach, casein, gelatin, aesculine, arbutin, glycogen, chitin and keratin but failed to degrade, guanine, elastine, xylan, testesterone or urea Table(72).

Table(72):Degradative potentialies of some complex compounds of isolates Nos. 20-55 and 48.

complex compound	isolates Nos.	
	20-55	48
hypoxanthine	1	1
guanine	0	0
elastine	0	0
tyrosine	1	1
adenine	1	1
DNA	1	1
RNA	1	1
tween 80	1	1
starch	1	1
xylan	0	0
casein	1	1
testesterone	0	0
urea	0	0
gelatin	1	1
aesculin	1	1
arbutin	1	1
glycogen	1	1
chitin (wool)	1	1
keratin (feather)	1	1

TAXONOMIC IDENTIFICATION OF ISOLATES OF GROUP EIGHT

On the basis of the characteristics obtained for isolates of this group they were identified as Streptomyces gilvoroseus (Krassilnikov, 1970).

GROUP NINE

This group includes five isolates Nos. 171, 204, 214, 232 and 356, of these isolates Nos. 171 and 214 were considered representative ones.

MORPHOLOGICAL CHARACTERISTICS

Spore chain morphology

The microscopic examination of the aerial growth of the experimented isolates of the present group in streak cultures showed that they produce very long straight chains of spores, which are usually arranged in long tufts. The spore chain may be somewhat wavy or slightly flexuous (Fig.25).

Spore morphology and ornamentation

The electron microscopic examination of cultures of the isolates of the present group revealed that they produce long cylinderical spores with slightly abrupt ends. Spore surface is smooth (Fig.26).

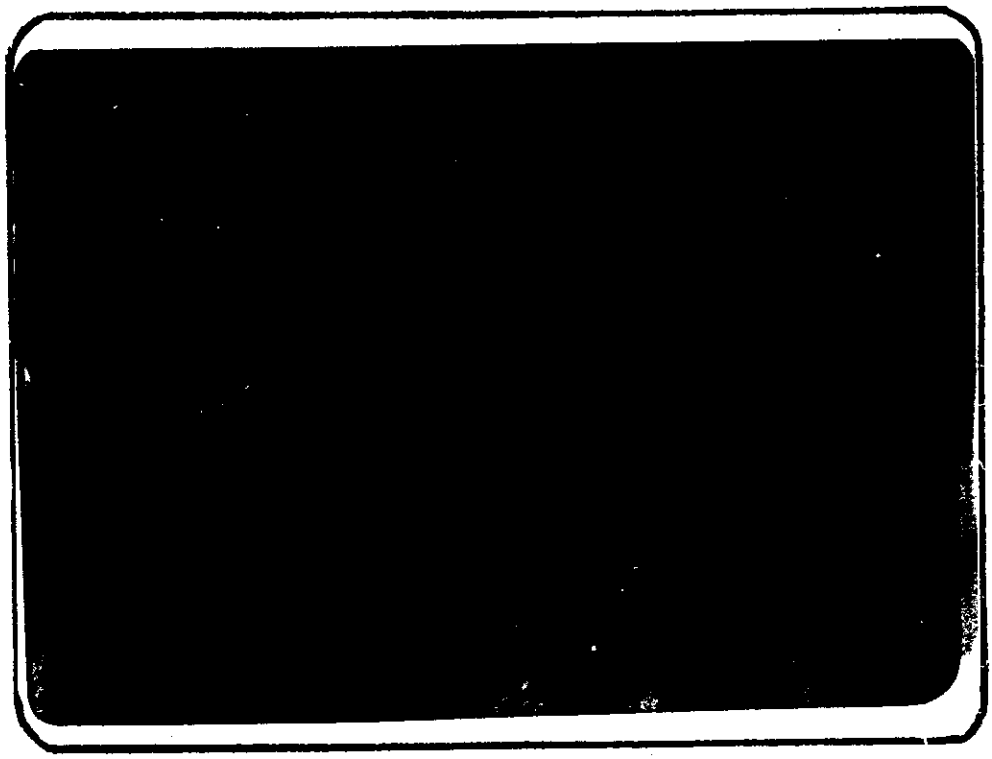


Fig (25) : Microphotograph of spore chains of isolate No. 214 (X 400).

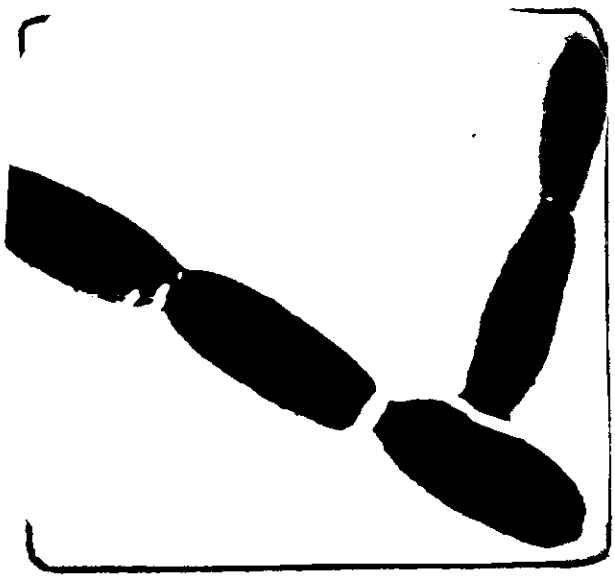


Fig (26) : Electron micrograph of spores of isolate No. 214 (X25000).

Table (73): Morphological and cultural charateristics of isolates No. 171 and 214.

character	isolates Nos.	
	171	214
spore chain morphology		
rectiflexibiles	1	1
rectinaculiaperti	0	0
spirales	0	0
verticillate	0	0
long tufts	1	1
spore chain ornamentation		
smooth	1	1
warty	0	0
spiny	0	0
hairy	0	0
rugose	0	0
production of aerial spore mass	1	1
colour of aerial spore mass		
red	1	1
yellow	0	0
grey	0	0
green	0	0
blue	0	0
violet	0	0
white	0	0
melanin production on:		
peptone-yeast-iron agar	1	1
tyrosine agar	1	1
fragmentation of mycelium	0	0
sclerotia formation	0	0
sporulation of substrate mycelium	0	0

CULTURAL CHARACTERISTICS

The cultural characteristics of the isolates of the present group showed that these organisms when cultivated on starch nitrate agar, glycerol nitrate agar, yeast malt extract agar, oat meal agar, glycerol asparagine agar, and fish meal extract agar, gave good growth with greyish yellowish pink colour aerial mycelium, substrate growth varied from light olive brown to light olive grey. Media varied from light olive brown to light brown grey Table (74).

Melanin pigment production

Isolates of the present group produced melanin pigments when cultivated on either peptone yeast-iron agar, or tyrosine agar Table (73).

Table (74): Cultural characteristies of 14 days old cultures of isolates Nos. 171 and 214 on different agar media.

medium	colour of aer. mycelium	colour of substrate mycelium	colour of medium
starch nitrate agar	greyish yellowish pink	light olive brown	light olive brown
glycerol nitrate agar	greyish yellowish pink	light olive brown	light olive brown
yeast malt extract agar	greyish yellowish pink	light olive brown	light olive brown
oat meal agar	greyish yellowish pink	light olive brown	light olive brown
glycerol asparagine agar	greyish yellowish pink	light olive brown	light olive brown
fish meal extract agar	greyish yellowish pink	light olive grey	light olive grey

GROWTH CHARACTERISTICS

Growth at different incubation temperature and pH

The optimum growth temperature of isolates of the present group was found to be 28 °C, isolates gave weak growth at 10 °C, no growth at 45 °C or 52 °C. This indicates that these isolates are true mesophiles. Isolates failed to give any growth at pH 4.3 but gave very good growth at pH 7.0 Table (75)*

Table (75): Growth of isolates Nos. 171 and 214 at different temperature pH and in presence of some inhibitors.

growth inhibitors		isolates Nos. 171	214
temeratures			
4 C°		0	0
10 C°		0	0
28 C°		1	1
45 C°		0	0
52 C°		0	0
pH			
4.3		0	0
7.0		1	1
growth inhibitors:			
NaCl 0 %		1	1
0.5%		1	1
4%		1	1
7%		0	0
10%		0	0
13%		0	0
sod. azide	0.01%	0	0
sod. azide	0.02%	0	0
phenol	0.1 %	0	0
potassium tellurite	0.001%	1	1
potassium tellurite	0.01%	0	0
thallous acetate	0.001%	1	1
thallous acetate	0.01%	1	1
crystal violet	0.0001%	1	1

Growth in presence of some inhibitors

Isolates of the present group were found to tolerate NaCl concentrations up to 4% showing intense growth at 0.5% NaCl (Table 3). Growth of isolates of this group was inhibited by 0.01% and 0.02% sodium azide, 0.1% phenol, 0.01% potassium tellurite but was not affected by 0.001% or 0.01% thallous acetate or 0.0001% crystal violet Table (75).

Growth on sole carbon sources

Isolates of this group succeeded to assimilate L-arabinose, sucrose, meso-inositol, mannitol, D-fructose, L-rhamnose, raffinose, L-mannose, D-lactose, raffinose, trehalose, D-galactose, cellobiose, sodium acetate, sodium citrate, sodium pyruvate and ammonium tartarate, but failed to assimilate D-xylose, salicin, dextran or sodium oxalate Table (76).

Growth on sole nitrogen sources

Isolates of the present group were found to utilize -- amino butyric acid, potassium nitrate, L-cysteine, L-valine, L-threonine, L-serine, L-methionine, L-histidine, L-arginine, L-hydroxyproline, alanine, glycine, cystine, glutamine, aspartic acid and tyrosine but failed to utilize L-phenylalanine or tryptophane Table (77).

Table (76): Growth of isolates No. 171 and 214 on sole carbon sources.

carbon source	isolates Nos.	
	171	214
L-arabinose	1	1
sucrose	1	1
D-xylose	0	0
meso-inositol	1	1
mannitol	1	1
D-fructose	1	1
L-rhamnose	1	1
raffinose	1	1
mannose	1	1
lactose	1	1
inulin	1	1
salicin	0	0
trehalose	1	1
dextran	0	0
D-galactose	1	1
cellobiose	1	1
sodium acetate	1	1
sodium citrate	1	1
sodium pyruvate	1	1
sodium oxalate	0	0
ammonium tartarate	1	1

Table (77): Growth of isolates Nos. 171 and 214 on sole nitrogen sources.

nitrogen source	isolates Nos.	
	171	214
∝-amino butyric acid	1	1
potassium nitrate	1	1
L-cysteine	1	1
L-valine	1	1
L-threonine	1	1
L-serine	1	1
L-phenylalanine	0	0
L-histidine	1	1
L-arginine	0	0
L-hydroxyproline	1	1
tryptophane	0	0
alanine	1	1
glycine	1	1
leucine	1	1
cystine	1	1
glutamine	1	1
aspartic acid	1	1
tyrosine	1	1

ANTIMICROBIAL POTENTIALITIES

The antimicrobial potentialities of isolates of the present group, when cultivated on starch nitrate agar or fish meal extract agar showed that they failed to produce antimicrobial substances, that could inhibite the growth of the used test organisms representing Gram negative and Gram positive bacteria, yeasts or fungi.

SENSITIVITY TO DIFFERENT ANTIBIOTICS

Isolates of the present group were found to be sensitive to the inhibitory effect of gentamicin, neomycin, streptomycin, tobramycin, rifampicin, cephaloridine, dimethylchlortetracyline, oleandomycin and lincomycin but they were resistant to vancomycin and penicillin G. (Table (78).

Table (78): Sensitivity of isolates No. 171 and 214 to different antibiotics (ug ml^{-1}).

antibiotic		isolates Nos.	
		171	214
gentamicin	(100)	25	24
neomycin	(50)	20	20
streptomycin	(100)	30	30
tobramycin	(50)	30	30
rifampicin	(50)	20	20
cephaloridine	(100)	18	18
vancomycin	(100)	0	0
dimethylchlortetracycline	(500)	30	31
oleandomycin	(100)	24	24
lincomycin	(100)	18	16
penicillin G	(10 i.u)	0	0

* figures indicate width of zones of inhibition in mm.

SOME ENZYMATIC ACTIVITIES

Isolates of the present group exhibited well expressed lipolytic, cellulolytic, pectinolytic and chitinolytic activities, they reduced nitrates to nitrites, produced H_2S, coagulated and peptonized milk Table (79)•

Table (79): Some enzymatic activities of isolates No. 171 and 214.

enzymatic activities	isolates Nos.	
	171	214
lipolytic	1	1
keratinolytic	0	0
cellulolytic	1	1
pectinolytic	1	1
chitinolytic	1	1
nitrate reduction	1	1
production of H_2S	1	1
coagulation & peptonization of milk	1	1

DEGRADATIVE POTENTIALITIES OF SOME COMPLEX COMPOUNDS

Isolates of the present group succeeded to degrade hypoxanthine, elastine, tyrosine, adenine, DNA, RNA, tween 80, strach, xylan, casein, gelatine, aesculin, glycogen, and chitin. They failed to degrade, guanine, testesterone, urea, aesculine and keratin Table (80).

Table (80): Degradative potentialies of some complex compounds of isolates Nos. 171 and 214.

complex compound	isolates Nos.	
	171	214
hypoxanthine	1	1
guanine	0	0
elastine	1	1
tyrosine	1	1
adenine	1	1
DNA	1	1
RNA	1	1
tween 80	1	1
starch	1	1
xylan	1	1
casein	1	1
testesterone	0	0
urea	0	0
gelatin	1	1
aesculin	0	0
arbutin	1	1
glycogen	1	1
chitin (wool)	1	1
keratin (feather)	0	0

TAXONOMIC IDENTIFICATION OF ISOLATES OF GROUP NINE

On the basis of the obtained characteristics for the isolates of group nine they were identified as Streptomyces fradiofumosus, (Krassilnikov, 1970).

GROUP TEN

This group includes 7 isolates Nos. A-1, A-6, B-2, B-3, 20-26, 20-6 and M, of which isolates Nos. 20-26, A-1 and A-6 were considered representative ones.

MORPHOLOGICAL CHARACTERISTICS

Spore chain morphology

The microscopic examination of the aerial growth of the experimented seven isolates of the present group in streak cultures revealed that they produce short chains of spores, that may be straight or in the form of hooks or loops but never spiral in shape. These isolates of this group belong to the retinaculiaperti type of spore chains (Fig . 27).

Spore morphology and ornamentation

The electron microscopic examination of cultures of the isolates of the present group revealed that they produce spherical spores. Spore surface is smooth (Fig . 28).

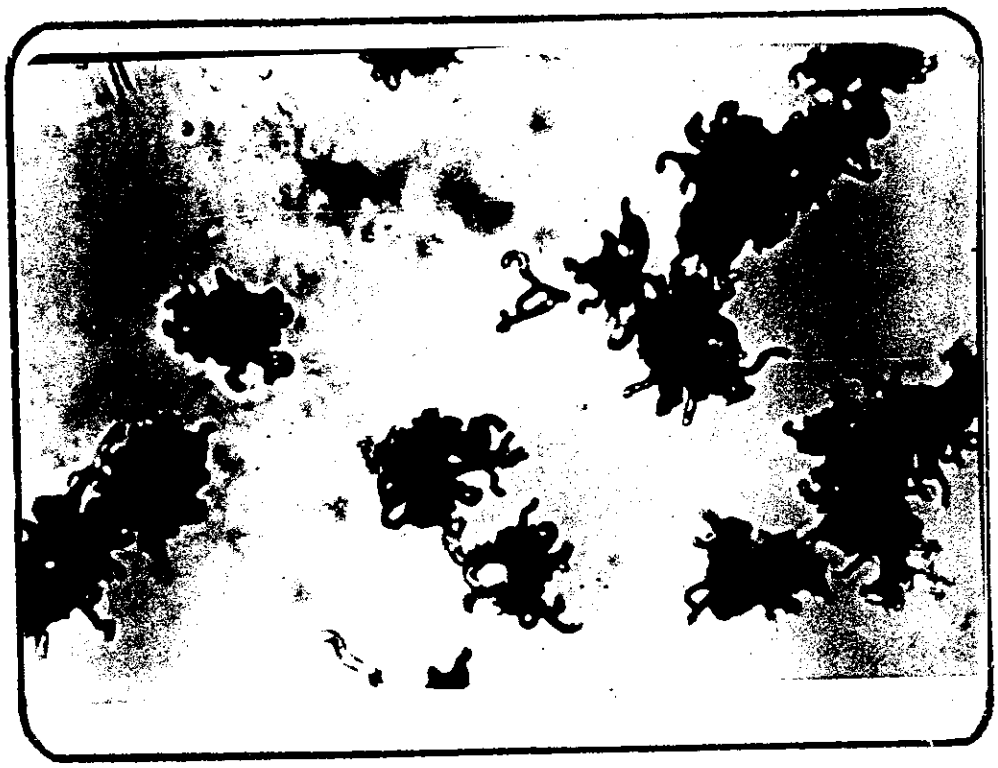


Fig (27) : Microphotograph of spore chains of isolate No. 20-26 (X 400).

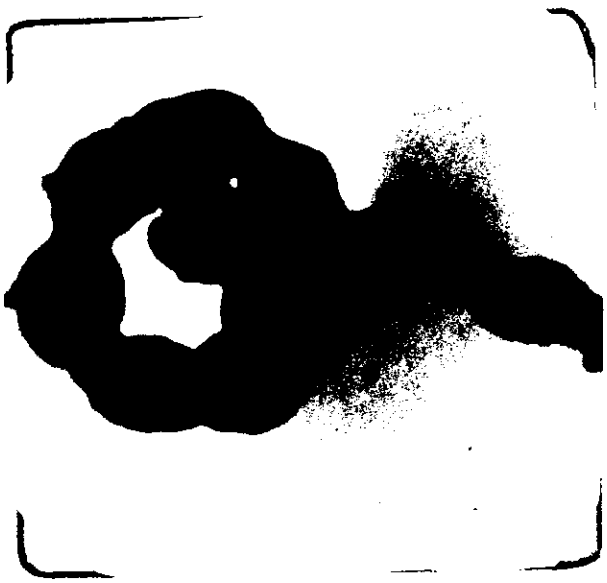


Fig (28) : Electron micrograph of spores of isolate No. 20-26 (X20000).

Table (81): Morphological and cultural charateristics of isolates Nos. 20–26, A-1 and A-6.

character	isolates Nos.		
	20–26	A-1	A-6
spore chain morphology			
rectiflexibiles	0	0	0
rectinaculiaperti	1	1	1
spirales	0	0	0
verticillate	0	0	0
spore chain ornamentation			
smooth	1	1	1
warty	0	0	0
spiny	0	0	0
hairy	0	0	0
rugose	0	0	0
production of aerial spore mass	1	1	1
colour of aerial spore mass			
red	1	1	1
yellow	0	0	0
grey	0	0	0
green	0	0	0
blue	0	0	0
violet	0	0	0
white	0	0	0
no distinctive substrate mycolial pigments	1	1	1
malanin production:			
peptone-yeast-iron agar	1	1	1
tyrosine agar	1	1	1
fragmentation of mycelium	0	0	0
sclerotia formation	0	0	0
sporulation of substrate mycelium	0	0	0

CULTURAL CHARACTERISTICS

The cultural characteristics of isolates of this group when cultivated on starch nitrate agar, glycerol nitrate agar, glycerol asparagine agar, oat meal agar, yeast malt extract agar or fish meal extract agar, gave good growth with light yellowish pink aerial myceluium with nonpigmented substrate mycelium. All media remained nonpigmented Table(82)•

Melanin pigment production

Isolates of this group succeeded to produce melanin pigments, when cultivated on either peptone yeast-iron agar or tyrosine agar Table (81)•

Table(82): Cultural characteristies of 14 days old cultures of isolates Nos. 20-26, A-1, A-6 on different agar media.

	colour of		
medium	aerial mycelium	substrate mycelium	medium
starch nitrate agar	light yellowish pink	nonpigmented	nonpigmented
glycerol nitrate agar	light yellowish pink	nonpigmented	nonpigmented
yeast malt extract agar	light yellowish pink	nonpigmented	nonpigmented
oat meal agar	light yellowish pink	nonpigmented	nonpigmented
glycerol asparagine agar	light yellowish pink	nonpigmented	nonpigmented
fish meal extract agar	light yellowish pink	nonpigmented	nonpigmented

GROWTH CHARACTERISTICS

Growth at different incubation temperatures and pH

The optimum growth temperature of isolates of this group was found to be 28 °C, they gave weak growth at 10 °C but no growth at 45 °C and 52 °C, which indicates that these isolates are true mesophiles. Isolates failed to give any growth at pH 4 .3 but gave very good growth at pH 7.0 Table (83).

Table (83): growth of isolates Nos. 20–26, A–1, A–6 at different temperature pH and in presence of some growth inhibitors.

growth inhibitors		isolates Nos.		
		20–26	A–1	A–6
temeratures				
4 C°		0	0	0
10 C°		1	1	1
37 C°		1	1	1
45 C°		0	0	0
52 C°		0	0	0
pH				
4.3		0	0	0
7.0		1	1	1
growth inhibitors:				
NaCl 0%		1	1	1
4%		1	1	1
7%		0	0	0
10%		0	0	0
13%		0	0	0
sod. azide	0.01%	1	1	1
sod. azide	0.02%	1	1	1
phenol	0.1 %	0	0	0
potassium tellurite	0.001%	1	1	1
potassium tellurite	0.01%	1	1	1
thallous acetate	0.001%	1	1	1
thallous acetate	0.01%	1	1	1
crystal violet	0.0001%	1	1	1

Growth in presence of some inhibitors

Isolates of this group were found to tolerate NaCl concentrations up to 4% and show intense growth at 0.5% NaCl (Table 3). Growth of isolates of this group was inhibited by 0.1% phenol but was not affected by 0.01% or 0.02% sodium azide, 0.001% or 0.01% potassium tellurite, 0.001% or 0.01% thallous acetate or 0.0001% crystal violet (Table 3).

Growth on sole carbone sources

Isolates of the present group succeeded to assimilate L-arabinose, sucrose, meso-inositol, mannitol, D-fructose, L-rhamnose, mannose, lactose, inuline, dextran, D-galctose, cellobiose, sodium acetate, sodium pyruvate but failed to assimilate D-xylose, salicin, trehalose, sodium citrate, sodium oxalate or ammonium tartarate (Table 4).

Growth on sole nitrogen sources

Isolates of this group were found to utilize --amino butyric acid, potassium nitrate, L-cysteine, L-valine, L-threonine, L-serine, L-arginine, L-hydroxyproline, alanine, glycine, leucine, cystine, glutamine, tyrosine but did not utilize L-phenylalanine, L-histidine, tryptophan or aspartic acid (Table 5).

Table (84) : Growth of isolates Nos. 20-26, A-1, A-6 on sole carbon sources.

carbon source	isolates Nos.		
	20-26	A-1	A-6
L-arabinose	1	1	1
sucrose	1	1	1
D-xylose	0	0	0
meso-inositol	1	1	1
mannitol	1	1	1
D-fructose	1	1	1
L-rhamnose	1	1	1
raffinose	1	1	0
mannose	1	1	1
lactose	1	1	1
inuline	0	0	0
salicin	0	0	0
trehalose	0	0	0
dextran	0	0	0
D-galactose	1	1	1
cellobiose	1	1	1
sodium acetate	1	1	1
sodium citrate	0	0	0
sodium pyruvate	1	1	1
sodium oxalate	0	0	0
ammonium tartarate	0	0	0

Table (85): Growth of isolates Nos. 20-26, A-1, A-6 on sole nitrogen sources.

nitrogen source	isolates Nos.		
	20-26	A-1	A-6
α-amino butyric acid	1	1	1
potassium nitrate	1	1	1
L-cysteine	1	1	1
L-valine	1	1	1
L-threonine	1	1	1
L-serine	1	1	1
L-phenylalanine	0	0	0
L-histidine	0	0	0
L-arginine	1	1	1
L-hydroxyproline	1	1	1
tryptophan	0	0	0
alanine	1	1	1
glycine	1	1	1
leucine	1	1	1
cystine	1	1	1
glutamine	1	1	1
aspartic acid	0	0	0
tyrosine	1	1	1

ANTIMICROBIAL POTENTIALITIES

The antimicrobial potentiatlities of isolates of this group, when cultivated on starch nitrate agar or fish meal extract agar showed that the studied isolates weakly produce antimicrobial substances, that inhibit the growth of only Bacillus subtilis, and Bacillus cereus. These produced antibiotic substances did not affect the growth of Escheichia coli Pseudomonas. fluorescens, Candida albicans, Saccharomyces cerevisiae, Fusarium oxysporum or Macrophomina phaseoli Table (86)*

Table (86): Antimicrobial potentialities of isolates Nos. 20-26, A-1 and A-1.

media	isolates Nos.	test organisms: E. coli	Ps. fluorescens	B. subtilis	B. cereus	Ca. albicans	Sach. cerevisiae	F. oxysporum	Ma. phaseoli
starch nitrate agar	20-26	0	0	8	8	0	0	0	0
	A-1	0	0	8	8	0	0	0	0
	A-6	0	0	10	10	0	0	0	0
fish extract agar	20-26	0	0	8	8	0	0	0	0
	A-1	0	0	10	10	0	0	0	0
	A-6	0	0	8	8	0	0	0	0

* figures indicate width of zones inhibition in mm.

SENSITIVITY TO DIFFERENT ANTIBIOTICS

Isolates of this group were found to be resistant to the inhibitory effect of rifampicin, cephaloridine, vancomycin or pencillin G. But were sensitive to gentamicin, neomycin, streptomycin, tobramycin, dimethylchlortetracycine, oleandomycin, or lincomycin (Table87).

Table (87): Sensitivity of isolates Nos. 20–26, A–1 and A–6 to different antibiotics (ug ml^{-1}).

antibiotic		isolates Nos.		
		20–26	A–1	A–6
gentamicin	(100)	20	26	12
neomycin	(50)	24	22	17
streptomycin	(100)	26	28	26
tobramycin	(50)	20	23	28
rifampicin	(50)	0	0	0
cephaloridine	(100)	0	0	0
vancomycin	(100)	0	0	0
dimethylchlortetracycline	(500)	20	22	23
oleandomycin	(100)	14	17	13
lincomycin	(100)	10	10	22
penicillin G	(10 i.u)	0	0	0

* Figures indicate width of zones of inhibition in min.

SOME ENZYMATIC ACTIVITIES

Isolates of this group exhibited well expressed lipolytic, pectinolytic and chitinolytic activities, reduced nitrates to nitrites, produced hydrogen sulphide., but failed to coagulate or poptonize milk (Table 88).

Table (88): Some enzymatic activities of isolates Nos. 20–26, A-1 and A-6.

enzymatic activities	isolates Nos.		
	20–26	A-1	A-6
lipolytic	1	1	1
keratinolytic	0	0	0
cellulolytic	0	0	0
pectinolytic	1	1	1
chitinolytic	1	1	0
nitrate reduction	1	1	1
production of H_2S	1	1	1
coagulation and peptonization of milk	0	0	0

DEGRADATIVE POTENTIALITIES OF SOME COMPLEX COMPOUNDS

Isolates of this group succeeded to degrade hypoxanthine, adenine, DNA, RNA, casein, gelatine, arbutin, gelycogen but failed to degrade guanine, elastine, tyrosine, tween 80, xylan, testesterone, urea, aesculine chitin or keratin (Table89).

Table (89): Degradative potentialites of some complex compounds of isolates Nos. 20–26, A-1 and A-6.

complex compound	isolates Nos.			
	20–26	A-1	A-6	-7
hypoxanthine	1	1	1	
guanine	0	0	0	
elastine	0	0	0	
tyrosine	0	0	0	
adenine	1	1	1	
DNA	1	1	1	
RNA	1	1	1	
tween 80	0	0	0	
starch	1	1	1	
xylan	0	0	0	
caseine	1	1	1	
testesterone	0	0	0	
urea	1	0	0	
gelatin	1	1	1	
aesculin	0	0	0	
arbutin	1	1	1	
glycogen	1	1	1	
chitin (wool)	0	0	0	
keratin (feather)	0	0	0	

TAXONOMIC IDENTIFICATION OF ISOLATES OF GROUP TEN

On the basis of the obtained characteristics for isolates of group ten and consulting references on the taxonomy of Streptomtcete it was found that isolates of group ten differ from the described Streptomyces species of the RED series and hence it was declared as a new species to which the name Streptomyces incarnatus, Hussein and El-Ayat, 1992, was coined.

GROUP ELEVEN

This group includes 15 isolates NOs. 1-B, 2-B, 3-4, 4-B, 5-B, 6-B, 7-B, 8-B, 10-B, 11-B, 12-B, 13-B, 14, 19-B, 20-B of which isolate No. 14 is conisdered representative.

MORPHOLOGICAL CHARACTERISTICS

Spore chain morphology

The microscopic examination of streak cultures of isolate showed that they produce spiral chains of spores. Spirals are long with 5-8 turns (Fig. 29).

Spore morphology and ornamentation

The electron microscopic examination of spore chains of isolate No. 14 showed that it produces cylindrical spores with more or less abrupt ends. Spore surface is smooth (Fig. 30).

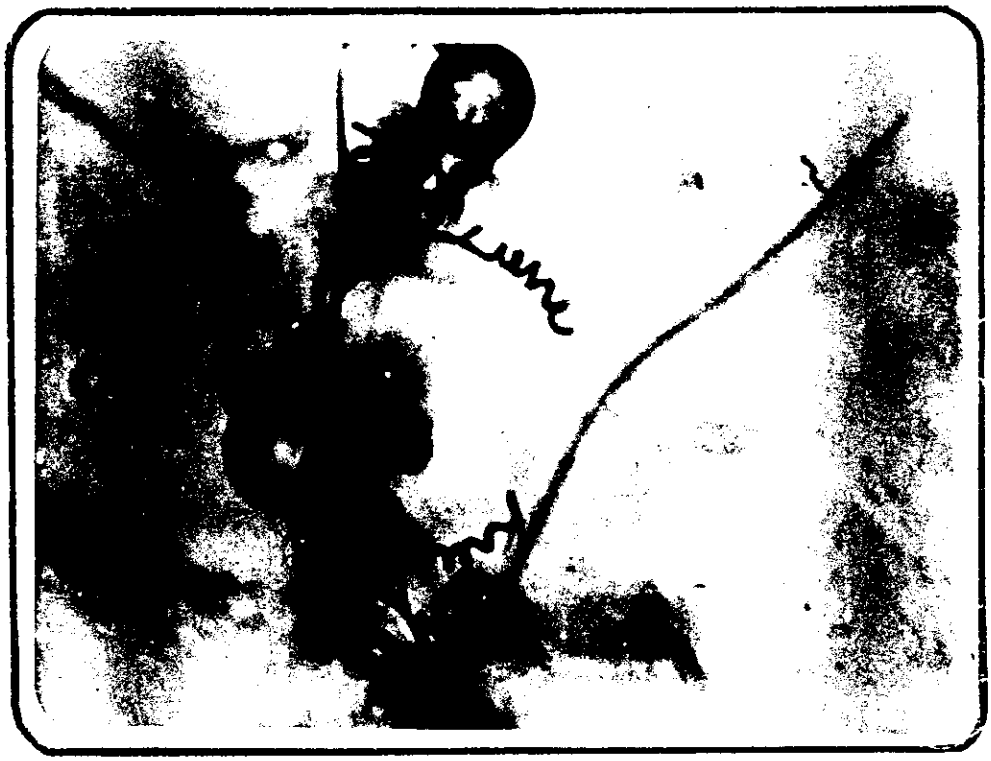


Fig (29) : Microphotograph of spore chains of isolate No. 14 (X 400).

Fig (30) : Electron micrograph of spores of isolate No. 14 (X 20000).

Table (90): Morphological and cultural charateristics of isolate No. 14

character	isolate No. 14
spore ahain morphology	
rectiflexibiles	0
rectinaculiaperti	0
spirales	1
verticillate	0
spore chain ornamentation	
smooth	1
warty	0
spiny	0
hairy	0
rugose	0
production of aerial spore mass	1
colour of aerial spore mass	
red	1
yellow	0
grey	0
green	0
blue	0
violet	0
white	
malanin production:	
peptone-yeast-iron agar	0
tyrosine agar	0
fragmentation of mycelium	0
sclerotia formation	0
sporulation of substrate mycelium	0

CULTURAL CHARACTERISTICS

The cultural characteristics of isolate No. 14 of the present group show that this organism when cultivated on starch nitrate agar, glycerol nitrate agar, yeast malt extract agar, oat meal agar , glycerol asparagine agar, or fish meal extract agar gave good growth having yellowish pink coloured aerial mycelium in all media but gave white aerial mycelium in fish meal extract agar, with nonpigmented substrat mycelium in the 4 media but gave brown substrat mycelium in the strach nitrate agar or glycerol asparagine agar, all media remained nonpigmented Table (91).

Melanin pigment production

Isolate of this group failed to produce melanin pigment when cultivated on peptone/yeast-iron agar or tyrosine agar Table (90).

Table (91): Cultural characteristies of 14 days old cultures of isolate No. 14 on different agar media.

	colour of		
medium	aerial mycelium	substrate mycelium	medium
starch nitrate agar	yellowish pink	brown	nonpigmented
glycerol nitrate agar	yellowish pink	nonpigmented	nonpigmented
yeast malt extract agar	yellowish pink	nonpigmented	nonpigmented
oat meal agar	yellowish pink	nonpigmented	nonpigmented
glycerol asparagine agar	yellowish piink	nonpigmented	nonpigmented
fish meal extract agar	yellowish pink	nonpigmented	nonpigmented

GROWTH CHARACTERISTICS

Growth at different incubation temperature and PH

The optimum growth temperature of isolates of the present group was found to be 28 °C, isolates gave weak growth at 10 °C no growth at 45 °C and 52 °C which indicates that these isolate are true mesophilies. Isolates failed to gave any growth at pH 4.3 but gave very good growth at pH 7.0 Table(92)•

Table(92): growth of isolate No. 14 at different temperature pH and in presence of some growth inhibitors.

growth inhibitors		isolates No. 14
temeratures		
4 C°		0
10 C°		1
37 C°		1
45 C°		0
52 C°		0
pH		
4.3		0
7.0		1
growth inhibitors:		
NaCl 0%		1
0.5%		1
4%		0
7%		0
10%		0
13%		0
sod. azide	0.01%	0
sod. azide	0.02%	0
phenol	0.1 %	0
potassium tellurite	0.001%	1
potassium tellurite	0.01%	1
thallous acetate	0.001%	1
thallous acetate	0.01%	1
crystal violet	0.001%	0

Gowth in presence of some inhibitors

The isolate of the present group was found to tolerate NaCl concentrations up to 4% and showed most intense growth at 0.5% Nacl (Table 3). Growth the of isolate of this group was inhibited by 0.01% or 0.2% sodium azide, 0.0001% crystal violet, 0.01% phenol. But the growth was not affected by 0.001% or 0.01 % potassium tellurite, or 0.001% or 0.01% thallous acetate Table(92) .

Growth on sole carbone sources

The isolate of the present group succeeded to assimilate L-arabinose, sucrose, meso-inositol, mannitol, D-fructose, L-rhamnose, raffinose, mannose, lactose, trehalose, D-galactose, cellobiose, and sodium acetate. But failed to assimilate D-xylose, inuline, salicin, sodium citrate, sodium pyruvate, sodium oxalate or ammonium tartarate Table (93),

Growth on sole nitrogen sources

The isolate of the present group was found to utilize potassium nitrate, L-cysteine, L-valine, L-threonine, L-serine, L-histidine, L-arginine, tryptophan, alanine, glycine, leucine, cystine, glutamine, aspartic acid, tyrosine but did not utilize -amino butyric acid, L-phenylalanine or L-hydroxyproline (Table 94).

Table (93): Growth of isolates No. 14 on sole carbon sources.

carbon source	isolate No. 14
L-arabinose	1
sucrose	1
D-xylose	0
meso-inositol	1
mannitol	1
D-fructose	1
L-rhamnose	1
raffinose	1
mannose	1
lactose	1
inuline	0
salicin	0
trehalose	1
dextran	1
D-galactose	1
cellobiose	1
sodium acetate	1
sodium citrate	0
sodium pyruvate	0
sodium oxalate	0
ammonium tartarate	0

Table (94): Growth of isolate No. 14 on sole nitrogen sources.

nitrogen source	isolate No. 14
α-amino butyric acid	0
potassium nitrate	1
L-cysteine	1
L-valine	1
L-threonine	1
L-serine	1
L-phenylalanine	0
L-methionine	1
L-histidine	1
L-arginine	1
L-hydroxyproline	0
tryptophan	1
alanine	1
glycine	1
leucine	1
cystine	1
glutamine	1
aspartic acid	1
tyrosine	1

ANTIMICROBIAL POTENTIALITIES

The antimicrobial potentiatialities of the isolate of this group when cultivated on starch nitrate agar or fish meal extract agar showed that the studied isolate failed to produce antimicrobial substances aganist Escherichia coli, Pseudomonas fluorescens, Bacillus subtilis, Bacillus cereus, Candida albicans, Saccharomyces cerevisiae, Fusarium oxysporum or Macrophomina phaseoli. but sometimes succeeded to produce antimicrobial substances that inhibted the growth of Bacillus subtilis or Candida albicans when cultivated on fish meal extract agar Table (95)*

Table (95): Antimicrobial spectrum of isolate No. 14.

media	isolates No.	test organisms							
		E. coli	Ps. fluorescns	B. subtilus	B. cereus	Ca. albicans	Sach. cerevisiae	F. oxysporum	Ma. phaseoli
starch nitrate agar	14	0	0	0	0	0	0	0	0
fish extract agar	14	0	0	12	0	15	0	0	0

* figures indicate width of zones of inhibition in mm.

SENSITIVITY TO DIFFERENT ANTIBIOTICS

The isolates of the present group are found not to be sensitive to the inhibitory effect of tobramycin, cephaloridine, vancomycin or pencillin G, but were sensitive to gentamicin, neomycin, streptomycin, rifampicin, dimethylchlortetracycline, oleandomycin, and lincomycin (Table 96).

Table (96): Sensitivity of isolate No. 14 to different antibiotics (ug ml^{-1}).

antibiotic		isolate No. 14
gentamicin	(100)	15
neomycin	(50)	15
streptomycin	(100)	20
tobramycin	(50)	0
rifampicin	(50)	15
cephaloridine	(100)	0
vancomycin	(100)	0
dimethylchlortetracycline	(500)	10
oleandomycin	(100)	10
lincomycin	(100)	10
penicillin G	(10 i.u)	0

* figures indicate width of zones of inhibition in mm.

SOME ENZYMATIC ACTIVITIES

The isolate of the present group exhibited well expressed lipolytic, keratinolytic, cellulolytic, pectinolytic and chitinolytic activites, reduced nitrates to nitrites, produced hydrogen sulphide. But failed to coagulateand peptonize of milk Table (97).

Table (97): Some enzymatic activities of isolate No. 14.

enzymatic activities	isolate No. 14
lipolytic	1
keratinolytic	1
cellulolytic	1
pectinolytic	1
chitinolytic	1
nitrate reduction	1
production of H_2S	1
coagulation G	0
peptonization of milk	0

TAXONOMIC IDENTIFICATION OF ISOLATES OF GROUP ELEVEN

On the basis of the obtained data for isolates of group eleven they were identified as belonging to Streptomyces vinaceusdrappus (Shirling and Gottlieb, 1969).

DEGRADATIVE POTENTIALIES OF SOME COMPLEX COMPOUNDS

The isolate of the present group succeeded to degrade hypoxanthine, tyrosine, adenine, DNA, RNA, tween 80, starch, caseine, gelatin, aesculin, arbutin, glycogen but failed to degrade guanine, elastine, xylan, testesterone or urea Table (98)•

Table (98): Degradative potentialites of some complex compounds of isolate No. 14.

complex compound	isolate No. 14
hypoxanthine	1
guanine	0
elastine	0
tyrosine	1
adenine	1
DNA	1
RNA	1
tween 80	1
starch	1
xylan	0
casein	1
testesterone	0
urea	0
gelatin	1
aesculin	1
arbutin	1
glycogen	1
chitin (wool)	1
keratin (feather)	1

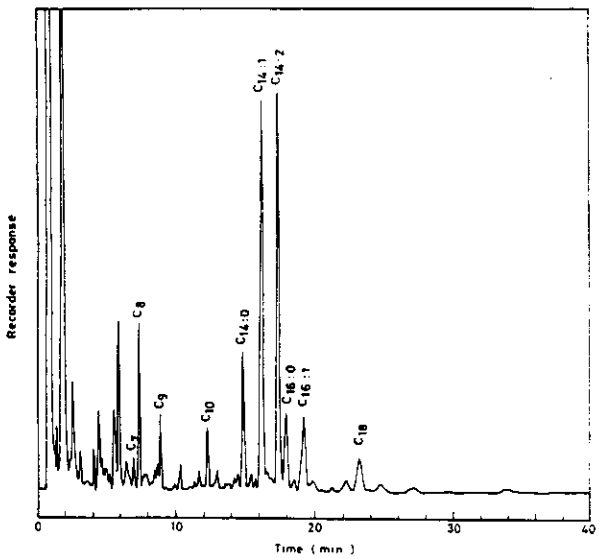
FATTY ACID COMPOSITION OF THE CELL WALL OF THE STUDIED STREPTOMYCETES AND ITS SIGNIFICANCE AS A TAXONOMIC CRITERION

Fatty acid composition of the cell wall is one of the newly suggested chemical criteria to be considered in actinomycete taxonomy. Composition of the studied fatty acid, in this thesis Streptomycetes, was carried out as described in material and methods.

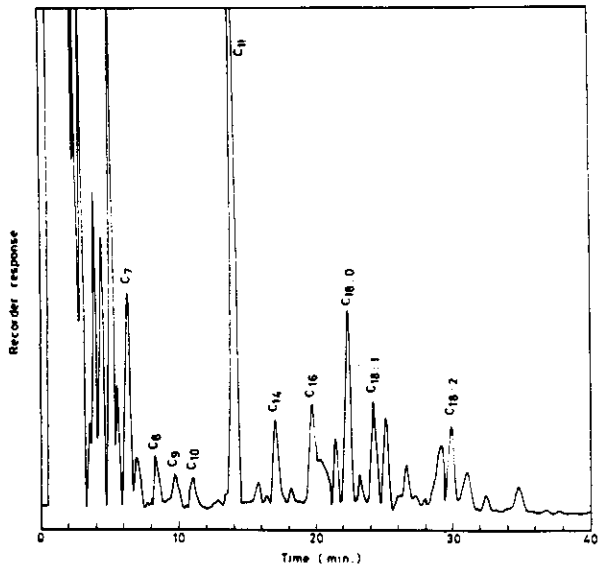
CINNAMON SECTION

The cell wall fatty acid composition was studied for the three Streptomyces species of the cinnamon group. The data represented in Fig. (31) show great differences. Thus for the fatty acid C 14:0 it was in moderate content in the cell wall of S.recticimamomeus, not present in S.toxytricini but in low content in S.roseolilacinus. for the fatty acid C 14 :1 while it was in high content in S.recticimamomeus, it was absent in S.toxytricini, but in moderate content in S. roseolilacinus.

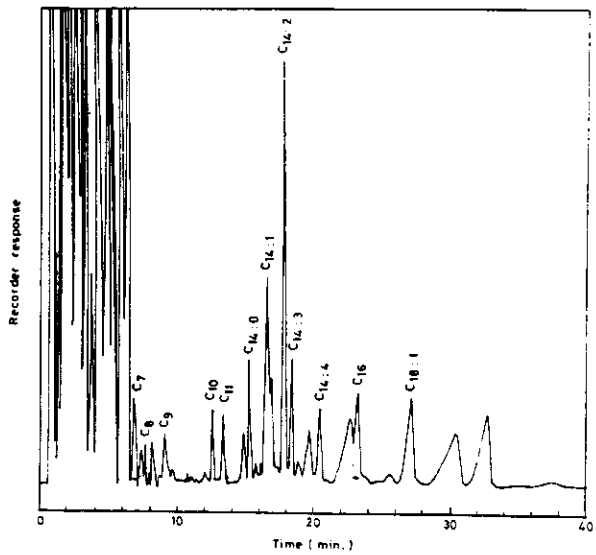
For the fatty acid C 14:2 it was in high content in S.recticimamomeus and S.roseolilacinus but absent in S.toxytricini. Great differences between the studied species are observed for the fatty acids C 16:0, C 16:1, C 16:2, C 18:0, C 18:1 and C 18:2.



S. recticimamomeus



S. toxytricini



S. roseolilacinus

Fig. (31): Gas liquid chromatographic analysis of the Fatty acid methyl esters of Streptomyces species of the cinnamon section.