Name:	***Micromonospora echinospora***
Authors:	Luedemann and Brodsky 1964 emend. Kasai et al. 2000
Status:	Approved Lists
Literature:	Int. J. Syst. Bacteriol. 30:321 (AL)
Risk group:	1 (German classification)
Comment:	emended description: IJSEM 50:131*
Type strain:	ATCC 15837, DSM 43816
Synonyms:	*Micromonospora purpurea* (heterotypic synonym), *Micromonospora rhodorangea* (heterotypic synonym)

Name:	*Micromonospora echinospora* subsp. *echinospora*
Authors:	Luedemann and Brodsky 1964
Status:	Approved Lists, Previously Subspecies
Literature:	Int. J. Syst. Bacteriol. 30:321 (AL)
Risk group:	1 (German classification)
Type strain:	ATCC 15837, DSM 43816
Synonym:	*Micromonospora echinospora*

Name:	*Micromonospora echinospora* subsp. *ferruginea*
Authors:	Luedemann and Brodsky 1964
Status:	Approved Lists, Previously Subspecies
Literature:	Int. J. Syst. Bacteriol. 30:321 (AL)
Risk group:	1 (German classification)
Type strain:	ATCC 15836, DSM 43141, NRRL 2995
Synonym:	*Micromonospora echinospora*

Name:	*Micromonospora echinospora* subsp. *pallida*
Authors:	Luedemann and Brodsky 1964
Status:	Basonym
Literature:	Int. J. Syst. Bacteriol. 30:322 (AL)
Risk group:	1 (German classification)
Type strain:	ATCC 15838, DSM 43817
Synonym:	*Micromonospora pallida*

Author(s)	Luedemann, G. M., Brodsky, B. C.
Title	Taxonomy of gentamycin-producing *Micromonospora*.
Journal	Antimicrob. Agents Chemother.
Volume	1963
Page(s)	116-124
Year	1964

Author(s)	Koch, C., Kroppenstedt, R. M., Stackebrandt, E.
Title	Intrageneric relationships of the actinomycete genus *Micromonospora*.
Journal	Int. J. Syst. Bacteriol.
Volume	46
Page(s)	383-387
Year	1996

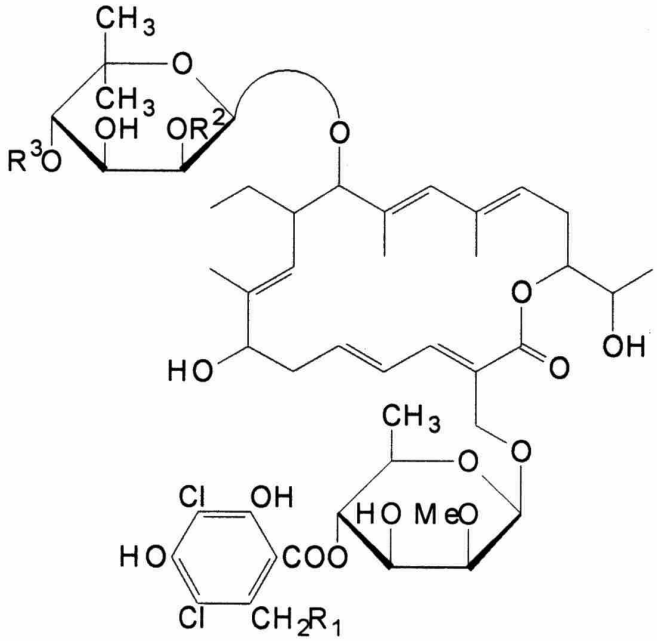
Author(s)	Kasai, H., Tamura, T., Harayama, S.
Title	Intrageneric relationships among *Micromonospora* species deduced from *gyrB*-based phylogeny and DNA relatedness.
Journal	Int. J. Syst. Evol. Microbiol.
Volume	50
Page(s)	127-134
Year	2000

Fatty acid pattern:

14 : 0	Iso	1,0	17 : 0		3,0
15 : 0	Iso	16,0	17 : 0	10methyl	2,0
15 : 0	Anteiso	2,0	18 : 1	cis 9	12,0
15 : 0		1,0	18 : 0		8,0
16 : 0	Iso	16,0			
16 : 1	cis 9	3,0			
16 : 0		7,0			
16 : 0	10methyl	4,0			
17 : 0	Iso	10,0			
17 : 0	Anteiso	7,0			
17 : 1	cis 9	7,0			

Secondary metabolites from *Micromonospora echinospora*

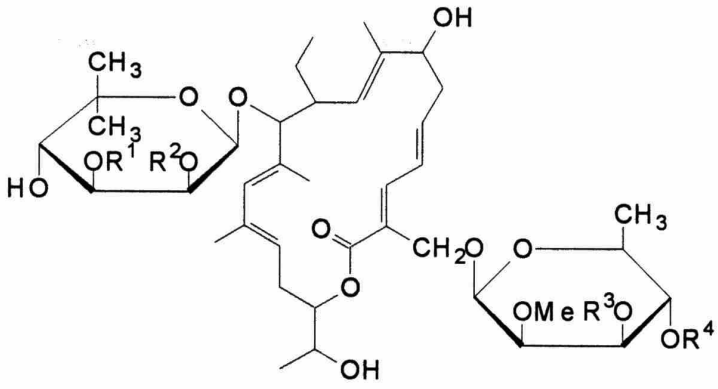
Liparmacin A (upper) and Tiacumicin C (lower) two macrolide antibiotics, active against gram-positive bacteria



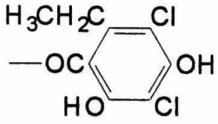
Lipiarmycin

A_3 R^1 = CH_3, R^2 = H, R^3 = $COCH(CH_3)_2$

A_4 R^1 = R^2 = H, R^3 = $COCH(CH_3)_2$



R^2 = —$COCH(CH_3)_2$, R^1 = R^3 = H

R^4 = 

Genus: ***Micromonospora*** **FH 2348**
Species: ***echinospora***
Numbers in other collections: ATCC 15837

Morphology:

	G	R
ISP 2	good	brown red
	A	SP
	none	none
	G	R
ISP 3	good	black red
	A	SP
	none	none
	G	R
ISP 4	good	brown red
	A	SP
	none	none
	G	R
ISP 5	good	black red
	A	SP
	white	none
	G	R
ISP 6	sparse	orange/ black red
	A	SP
	none	none
	G	R
ISP 7	good	black red
	A	SP
	none	none

Spore chains: Spore surface:
Sporangia: Fragmentation:

Melanoid pigment: - - - -
NaCl resistance: 0 %
Lysozyme resistance: -
pH: Value- from - Optimum-
Temperature : Value- Optimum- 28 ℃

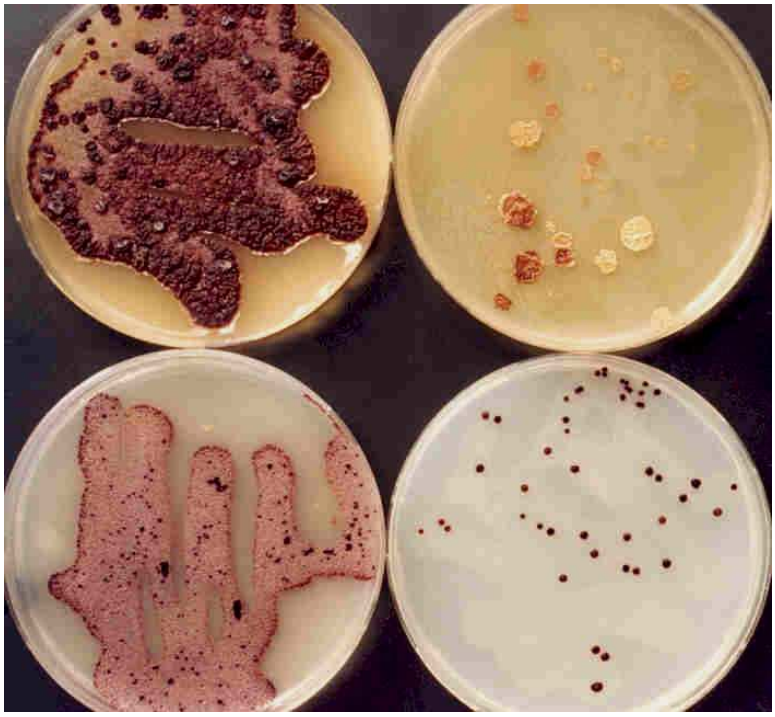
Carbon utilization:

Glu	Ara	Suc	Xyl	Ino	Man	Fru	Rha	Raf	Cel
+	+	+	-	-	-	-	+	+	-

Enzymes:

Gel	Cit	Ure	Arg	Onp	Trp	Lys	Odc	VP	Ind	H2S
+	-	-	-	-	-	-	-	+	-	-

2+ 3- 4+ 5- 6+ 7- 8+ 9(+) 10- 11+ 12- 13- 14+ 15- 16+ 17+ 18+ 19- 20-



Micromonospora echinospora
A and B – Agar plates medium 5265, 5315, 5317 and 5323

Micromonospora echinospora
C and D – Agar plates medium 5318, 5322, 5337 with and without tyrosine

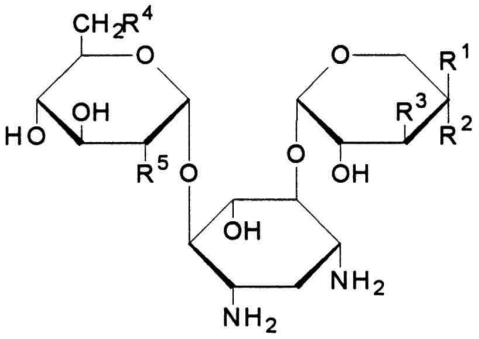
Genus	*Micromonospora*
Species	*echinospora*
Subspecies	
Author	Luedemann and Brodsky 1964
Reclassification	← *Micromonospora purpurea*
Status	Synonym
Type species	ATCC 15835, DSM 43036, IFO 12575, IMET 8212, NRRL 2953
Hazard group	1

Fatty acid pattern:

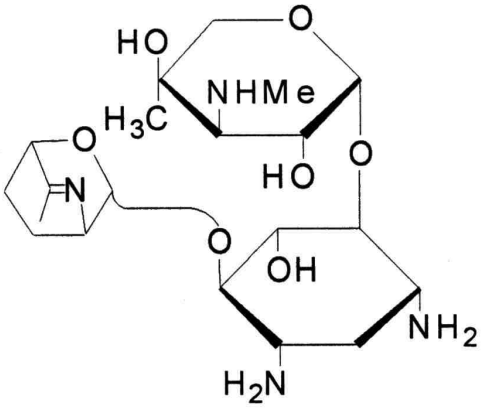
14 : 0	Iso	3,0		
15 : 0	Iso	20,0		
15 : 0	Anteiso	5,0	18 : 1 cis 9	7,0
15 : 0		2,0	18 : 0	9,0
16 : 0	Iso	19,0		
16 : 1	cis 9	3,0		
16 : 0		5,0		
16 : 0	10methyl	2,0		
17 : 0	Iso	9,0		
17 : 0	Anteiso	7,0		
17 : 1	cis 9	8,0		
17 : 0		5,0		

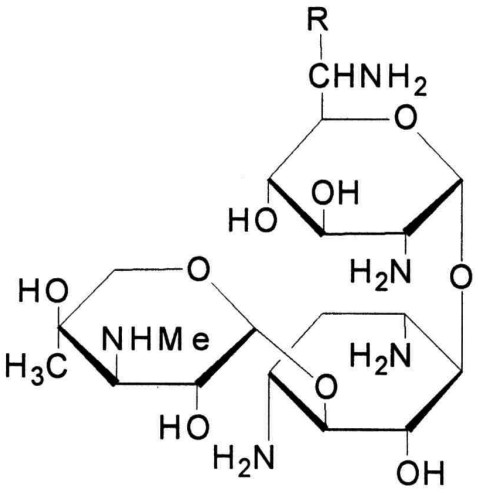
Secondary metabolites from *Micromonospora purpurea*

Gentamicin and related aminoglyciside antibiotics, broad spectrum antibiotics



R^1 = H, R^2 = OH,
R^3 = NHMe, R^4 = OH,
R^5 = NH_2





R = CH_3

Genus: ***Micromonospora*** **FH 1495**
Species: ***purpurea***
Numbers in other collections: DSM 43036
Synonym of Micromonospora echinospora
Morphology:

	G	R
ISP 2	good	pastel yellow
	A	SP
	none	none
	G	R
ISP 3	good	beige
	A	SP
	none	none
	G	R
ISP 4	good	pastel yellow
	A	SP
	none	none
	G	R
ISP 5	good	pastel yellow
	A	SP
	white	none
	G	R
ISP 6	sparse	pastel yellow
	A	SP
	none	none
	G	R
ISP 7	good	pastel yellow
	A	SP
	none	none

Spore chains: Spore surface:
Sporangia: Fragmentation:

Melanoid pigment: **- - - -**
NaCl resistance: 5 %
Lysozyme resistance: 0
pH: Value- from Optimum-
Temperature : Value- Optimum- 28 ℃

Carbon utilization:

Glu	Ara	Suc	Xyl	Ino	Man	Fru	Rha	Raf	Cel
+	+	+	+	+	+	+	+	+	+

Enzymes:

Gel	Cit	Ure	Arg	Onp	Trp	Lys	Odc	VP	Ind	H2S
+	-	-	-	-	-	-	-	+	-	-

2+ 3- 4+ 5+ 6+ 7(+) 8- 9(+) 10- 11+ 12+ 13- 14- 15+ 16+ 17+ 18+ 19- 20-

Micromonospora echinospora
A – Agar plates medium 5265, 5315, 5317 and 5323
B – Agar plates medium 5006, 5318, 5322, 5337 with and without tyrosine

Genus	*Micromonospora*
Species	*echinospora*
Subspecies	
Author	Wagman et al. 1974
Reclassification	← *Micromonospora rhodorangena*
Status	Synonym
Type species	ATCC 27932, DSM 1039, NRRL 5326
Hazard group	1

Micromonospora echinospora
A – Agar plates medium 5006, 5318, 5322, 5337 with and without tyrosine

Genus: ***Micromonospora*** **FH 2560**
Species: ***rhodorangena***
Numbers in other collections: ATCC 27932
Synonym of Micromonospora echinospora
Morphology:

	G	R
ISP 2	good	black red
	A	SP
	none	none
	G	R
ISP 3	good	black red
	A	SP
	none	none
	G	R
ISP 4	good	bright orange
	A	SP
	none	none
	G	R
ISP 5	good	black red
	A	SP
	white	none
	G	R
ISP 6	sparse	bright orange
	A	SP
	none	none
	G	R
ISP 7	good	black red
	A	SP
	none	none

Spore chains: Spore surface:
Sporangia: Fragmentation:

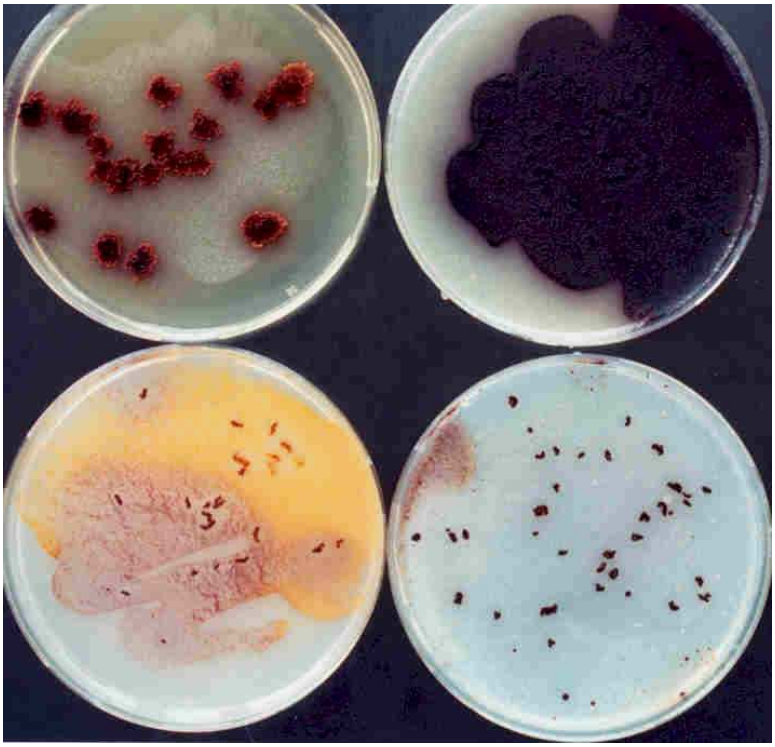
Melanoid pigment: - - - -
NaCl resistance: 0 %
Lysozyme resistance: -
pH: Value- from - Optimum-
Temperature : Value- Optimum- 28 ℃

Carbon utilization:

Glu	Ara	Suc	Xyl	Ino	Man	Fru	Rha	Raf	Cel

Enzymes:

Gel	Cit	Ure	Arg	Onp	Trp	Lys	Odc	VP	Ind	H2S
-	-	-	+	-	-	+	+	-	-	-



Micromonospora echinospora
B and C – Agar plates medium 5265, 5315, 5317 and 5323