Class

Actinobacteria

Subclass

Actinobacteridae

Order

Actinomycetales

Suborder

Streptosporangineae

Family

Streptosporangiaceae

Genus

Microbispora

The Genus Microbispora

To the genus *Microbispora* belong only three species *Microbispora corallina, mesophila* and *rosea.* The genus *Microbispora* was overspeciated and Miadoh et al. (1990) proposed that *M. rosea, M. amethystogenes, M. chromogenes, M. diastatica, M. indica, M. karnatakensis* and *M. parva* should be combined into the species *M. rosea subsp. rosea* and that *M. aerata, M. thermodiastatica* and *M. thermorosea* should be combined and transferred to the new subspecies *M. rosea* subsp. *aerata.*
Microbispora bispora was transferred to the genus *Thermobispora* by Wang et. al. 1996 and *Thermomonospora mesophila* to *Microbispora* by Wang et al. 1998.

A stable, branched mycelium carries spores single or in pairs on aerial mycelium, spores are not usually formed on the substrate mycelium. The spores are sessile or on short sporophores, spherical to oval (usually 1,2 to 1,6 µm in diameter) and nonmotile. The spore surface is smooth. Mesophilic and thermophilic.

The characteristic fatty acids of the cell wall are 16 : 0 iso, 16 : 0, 16 : 0 10methyl, 17 : 0, 17 : 0 10methyl, 18 : 1 cis9 and 18 : 0. A tetrahydrogenated menaquinone with nine isoprene units (MK-9(H_4)) is the predominant isoprenolog. Common in soil.

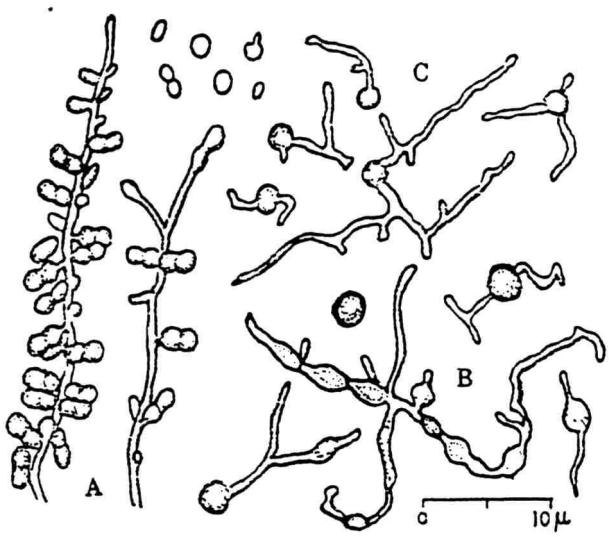


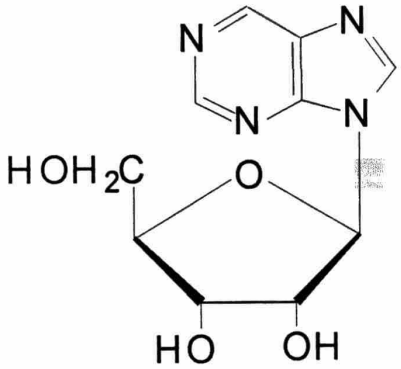
Fig. 1. *Microbispora rosea* sp. nov.
A : Sporulation,
B : Chlamydospores,
C : Germination of conidia

Type species is ***Microbispora rosea*.**

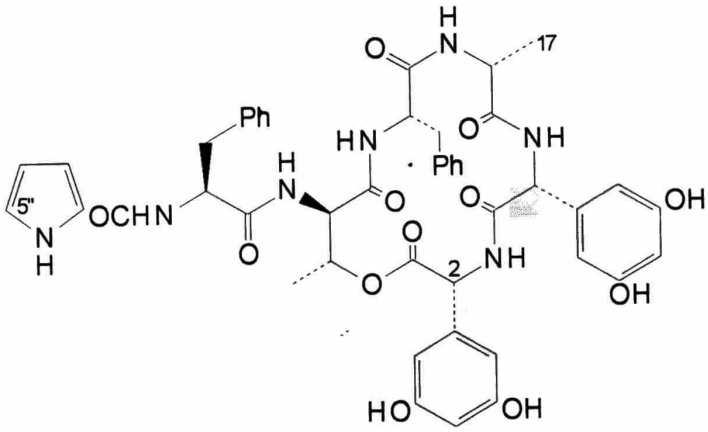
Nonomura and Ohara. 1957
Distribution of actinomycetes in soil. II
Microbispora, a new genus of *Streptomycetaceae.*
J. Ferment. Technol. 35: 307-311

Zhang, Z., Wang, Y., Ruan, J. 1998
Reclassification of *Thermomonospora* and *Microtetraspora*.
Int. J. Syst. Bacteriol. 48: 411-422

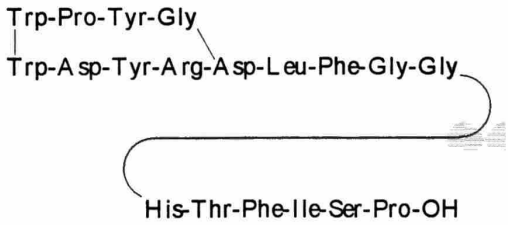
The data of secondary metabolites from Microbispora species might be problematic basing on the taxonomic changes in the genus, but they are reported here.
Nebularine, nucleoside antibiotic from Microbispora sp., shows tuberculostatic and antimitotic activity



Cochinmicin I, cyclic depsipeptide antibiotic from Microbispora sp., endothelin antagonist



Cyclic peptide antibiotic from Microbispora sp., prolyl endopeptidas inhibitor



Genus Identity Card

Genus	***Microbispora***
Wall chemotype	meso-DAP (type III)
Whole cell sugar pattern	madurose
Fatty acid pattern	iso C 16:0, C 17:1, 10 methyl C 17:0
Major menaquinone (MK)	-9(H_2, H_4, H_6)
Phospholipidtype	phosphatidylethanolamine
Mol% G+C of DNA	67-74
Morphology	stable branched mycelium carries spores, single or in pairs on aerial mycelium
Type species	*Microbispora rosea*

Microbispora rosea

Name: MICROBISPORA
Authors: Nonomura and Ohara 1957 emend. Zhang et al. 1998
Status: Approved Lists
Type species: M. rosea
Literature: Int. J. Syst. Bacteriol. 30:319 (AL)
Comment: emended description: IJSB 48:418

Name: *Microbispora aerata*
Authors: (Gerber and Lechevalier 1964) Cross 1974
Status: Basonym
Literature: Int. J. Syst. Bacteriol. 30:319 (AL)
Type strain: ATCC 15448, DSM 43176, IMET 9503
Synonym: *Microbispora rosea* subsp. *aerata*

Name: *Microbispora amethystogenes*
Authors: Nonomura and Ohara 1960
Status: Heterotypic Synonym
Literature: Int. J. Syst. Bacteriol. 30:319 (AL)
Comment: synonymy: J. Gen. Microbiol. 136:1910 (1990)
Type strain: CBS 303.61, DSM 43164, IMET 9533, NRRL B-2637, RIA 760
Synonym: *Microbispora rosea* subsp. *rosea*

Name: *Microbispora bispora*
Authors: (Henssen 1957) Lechevalier 1965
Status: Basonym
Literature: Int. J. Syst. Bacteriol. 30:319 (AL)
Risk group: 1 (German classification)
Type strain: ATCC 19993, DSM 43833
Synonym: *Thermobispora bispora*

Name: *Microbispora chromogenes*
Authors: Nonomura and Ohara 1960
Status: Heterotypic Synonym
Literature: Int. J. Syst. Bacteriol. 30:319 (AL)
Comment: synonymy: J. Gen. Microbiol. 136:1910 (1990)
Type strain: DSM 43165, NRRL B-2634
Synonym: *Microbispora rosea* subsp. *rosea*

Name: *Microbispora corallina*
Authors: Nakajima et al. 1999
Status: New Species
Literature: Int. J. Syst. Bacteriol. 49:1766
Risk group: 1 (German classification)
Type strain: DF-32, JCM 10267, DSM 44682

Name: *Microbispora diastatica*
Authors: Nonomura and Ohara 1960
Status: Heterotypic Synonym
Literature: Int. J. Syst. Bacteriol. 30:319 (AL)
Comment: synonymy: J. Gen. Microbiol. 136:1910 (1990)
Type strain: KCC A-0023
Synonym: *Microbispora rosea* subsp. *rosea*

Name: *Microbispora echinospora*
Authors: Nonomura and Ohara 1971
Status: Basonym
Literature: Int. J. Syst. Bacteriol. 30:319 (AL)
Type strain: ATCC 27300, DSM 43163
Synonym: *Actinomadura echinospora*

Name: *Microbispora indica*
Authors: Rao et al. 1987
Status: Heterotypic Synonym
Literature: Int. J. Syst. Bacteriol. 37:181
Comment: synonymy: J. Gen. Microbiol. 136:1910 (1990)
Type strain: ATCC 35926, SKF-I-101055
Synonym: *Microbispora rosea* subsp. *rosea*

Name: *Microbispora karnatakensis*
Authors: Rao et al. 1987
Status: Heterotypic Synonym
Literature: Int. J. Syst. Bacteriol. 37:181
Comment: synonymy: J. Gen. Microbiol. 136:1911 (1990)
Type strain: ATCC 35927, SKF-I-58261
Synonym: *Microbispora rosea* subsp. *rosea*

Name: *Microbispora mesophila*
Authors: (Nonomura and Ohara 1971) Zhang et al. 1998
Status: New Combination
Literature: Int. J. Syst. Bacteriol. 48:418
Risk group: 1 (German classification)
Type strain: ATCC 27303, DSM 43048
Synonyms: *Thermomonospora mesophila* (basonym)

Name: *Microbispora parva*
Authors: Nonomura and Ohara 1960
Status: Heterotypic Synonym
Literature: Int. J. Syst. Bacteriol. 30:319 (AL)
Comment: synonymy: J. Gen. Microbiol. 136:1911 (1990)
Type strain: KCC A-0024
Synonym: *Microbispora rosea* subsp. *rosea*

Name: *Microbispora rosea* subsp. *aerata*
Authors: (Gerber and Lechevalier 1964) Miyadoh et al. 1991
Status: New Combination
Literature: Int. J. Syst. Bacteriol. 41:178 (validation list)
Risk group: 1 (German classification)
Type strain: ATCC 15448, DSM 43176, IFO 12581
Synonyms: *Microbispora aerata* (basonym), *Microbispora thermodiastatica* (heterotypic synonym), *Microbispora thermorosea* (heterotypic synonym)

Name: ***Microbispora rosea* subsp. *rosea* (Type species)**
Authors: Nonomura and Ohara 1957
Status: Approved Lists
Literature: Int. J. Syst. Bacteriol. 30:319 (AL)
Risk group: 1 (German classification)
Type strain: ATCC 12950, DSM 43839, IMET 9534, JCM 3006
Synonyms: *Microbispora amethystogenes* (heterotypic synonym), *Microbispora chromogenes* (heterotypic synonym), *Microbispora diastatica* (heterotypic synonym), *Microbispora indica* (heterotypic synonym), *Microbispora karnatakensis* (heterotypic synonym), *Microbispora parva* (heterotypic synonym)

Name: *Microbispora thermodiastatica*
Authors: Nonomura and Ohara 1969
Status: Heterotypic Synonym
Literature: Int. J. Syst. Bacteriol. 30:319 (AL)
Comment: synonymy: J.Gen. Microbiol. 136:1911 (1990)
Type strain: ATCC 27098, CBS 799.70, DSM 43166
Synonym: *Microbispora rosea* subsp. *aerata*

Name: *Microbispora thermorosea*
Authors: Nonomura and Ohara 1969
Status: Heterotypic Synonym
Literature: Int. J. Syst. Bacteriol. 30:319 (AL)
Comment: synonymy: J. Gen. Microbiol. 136:1911 (1990)
Type strain: ATCC 27099
Synonym: *Microbispora rosea* subsp. *aerata*

Name: *Microbispora viridis*
Authors: Miyadoh et al. 1985
Status: Basonym
Literature: Int. J. Syst. Bacteriol. 35:283
Comment: new name according to Rule 41a
Type strain: IFO 14382, SF-2240, DSM 44130
Synonym: *Actinomadura rugatobispora*

Genus	*Microbispora*
Species	*rosea*
Subspecies	*rosea*
Author	Nonomura and Ohara 1957

Reclassification	
Status	Approved Lists

Type species	ATCC12950, CBS 307.61, IMET 9534, DSM 43839

Hazard group	1

Fatty acid pattern:

14 : 0		2,0			
15 : 0	Iso	3,0	16 : 0	Iso 2 OH	2,0
15 : 0		3,0	17 : 0		5,0
16 : 0	Iso	16,0	17 : 0	10methyl	4,0
16 : 1	cis 9	2,0	18 : 0	Iso	1,0
16 : 0		31,0	18 : 1	cis9	3,0
16 : 0	10methyl	7,0	18 : 0		10,0
17 : 0	Iso	2,0			
17 : 0	Anteiso	2,0			
17 : 1	cis9	1,0			

Genus: ***Microbispora*** **FH 2144**
Species: ***rosea***
Numbers in other collections: CBS 307.61

Morphology:

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

Spore chains: only spore pairs
Spore surface: smooth
Sporangia:
Fragmentation:

Melanoid pigment: - - - -
NaCl resistance: 2,5 %
Lysozyme resistance: -
pH: Value- Optimum-
Temperature : Value- Optimum- 30 ℃

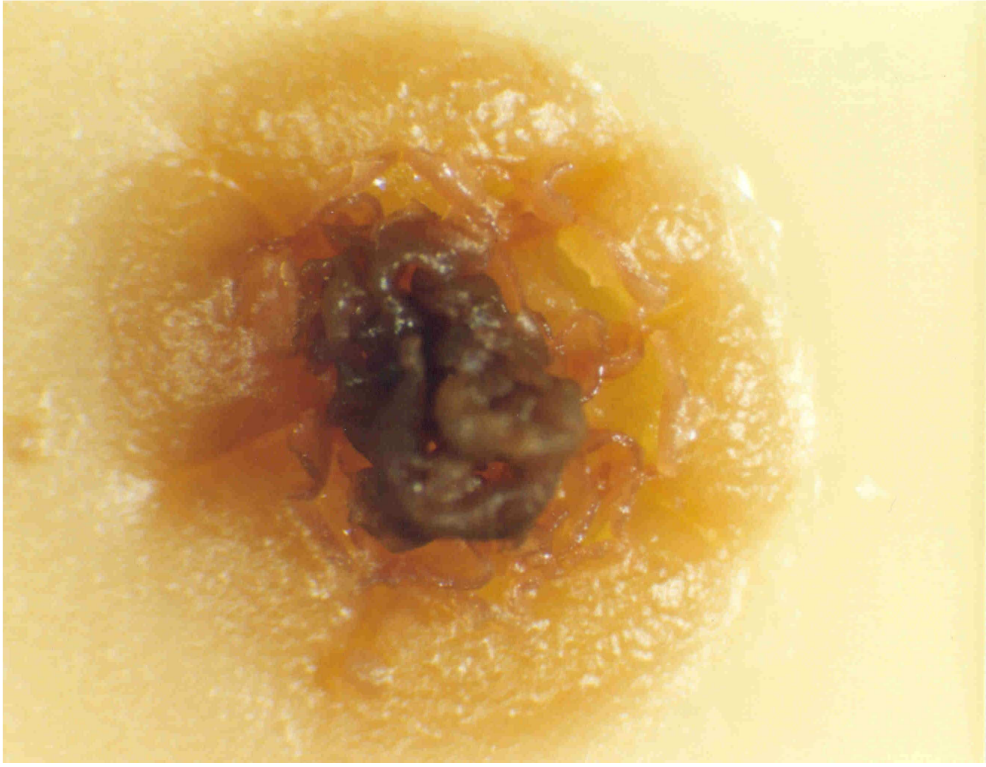
Carbon utilization:

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

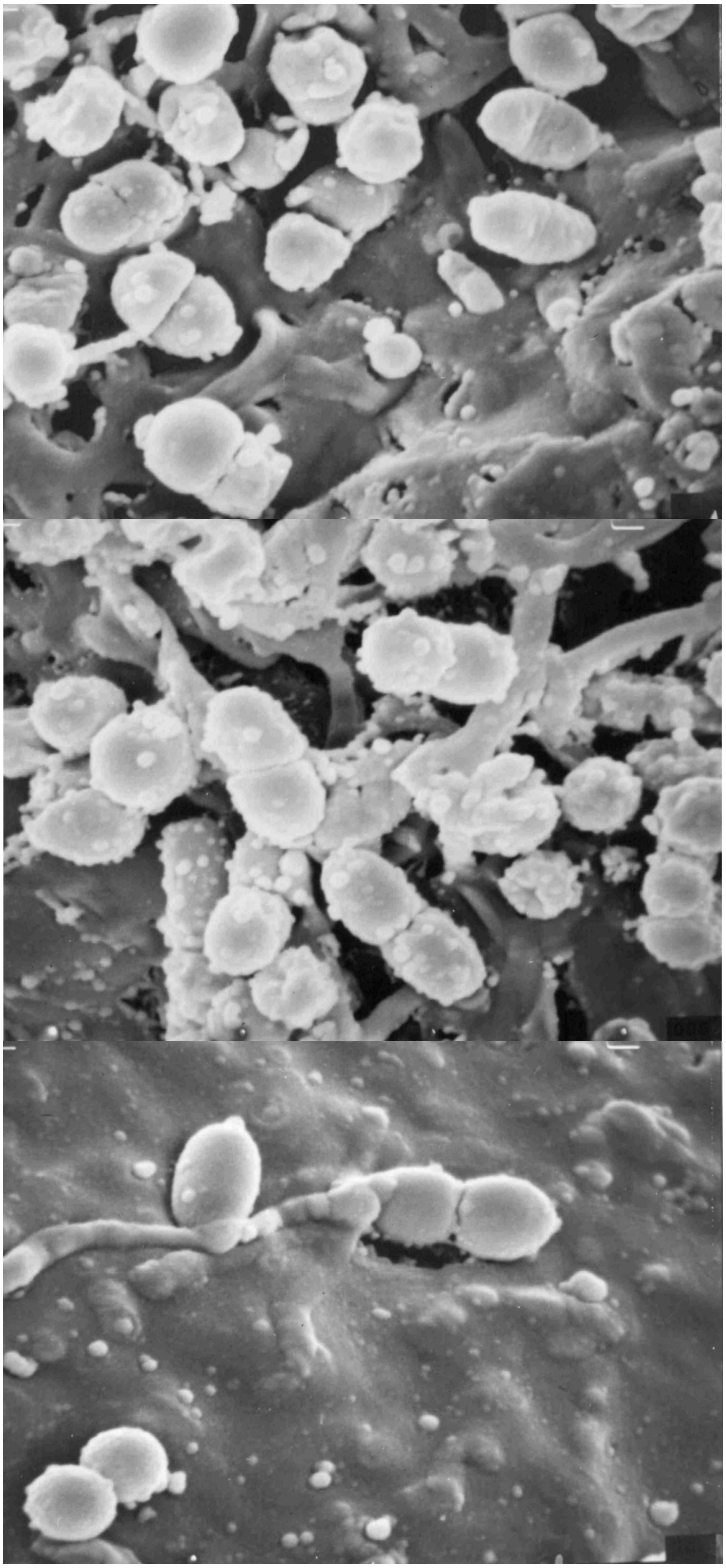
Enzymes:

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-



Microbispora rosea* subsp. *rosea
A – Colony detail on medium 5323
B – Colony detail on medium 5294



Microbispora rosea* subsp. *rosea
Spore pairs and smooth spore surface in SEM
C – E x 10.000

Genus	*Microbispora*
Species	*rosea*
Subspecies	*rosea*
Author	Nonomura and Ohara 1960
Reclassification	← *Microbispora amethystogenes*
Status	Heterotypic Synonym
Type species	DSM 43164, IMET 95343, NRRL B-2637
Hazard group	1

Fatty acid pattern:

14 : 0		2,0			
15 : 0	Iso	3,0	16 : 0	Iso 2 OH	3,0
15 : 0		3,0	17 : 0		3,0
16 : 0	Iso	22,0	17 : 0	10methyl	11,0
16 : 1	cis 9	7,0	18 : 1	cis9	3,0
16 : 0		12,0	18 : 0		4,0
16 : 0	10methyl	12,0			
17 : 0	Iso	1,0			
17 : 0	Anteiso	1,0			
17 : 1	cis9	4,0			

Genus: ***Microbispora*** **FH 2228**
Species: ***rosea*** **Subspecies:** ***rosea***
Numbers in other collections: IMET 9533
Former Microbispora amethystogenes

Morphology:

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

Spore chains: only spore pairs Spore surface: smooth
Sporangia: Fragmentation:

Melanoid pigment: **- - - -**
NaCl resistance: 2,5 %
Lysozyme resistance: -
pH: Value- Optimum-
Temperature : Value- Optimum- 30 ℃

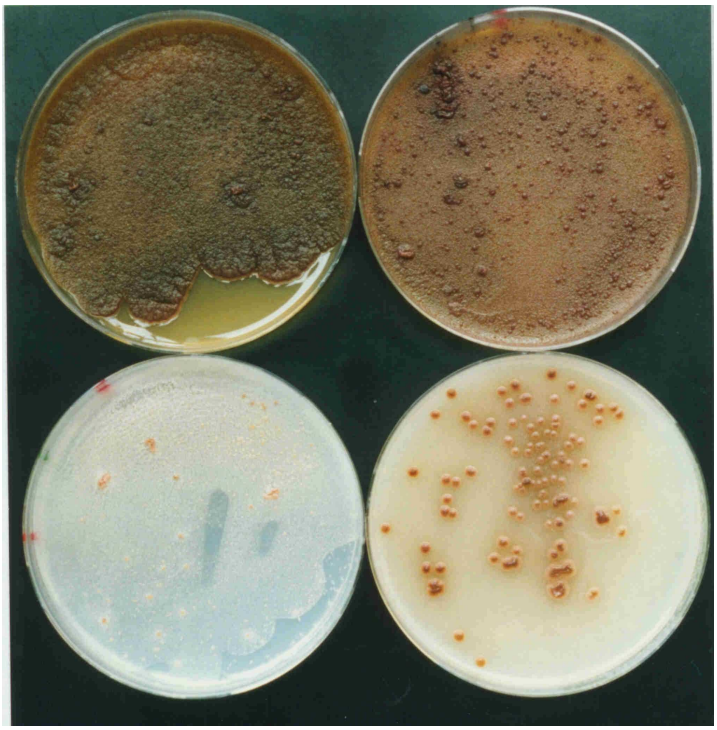
Carbon utilization:

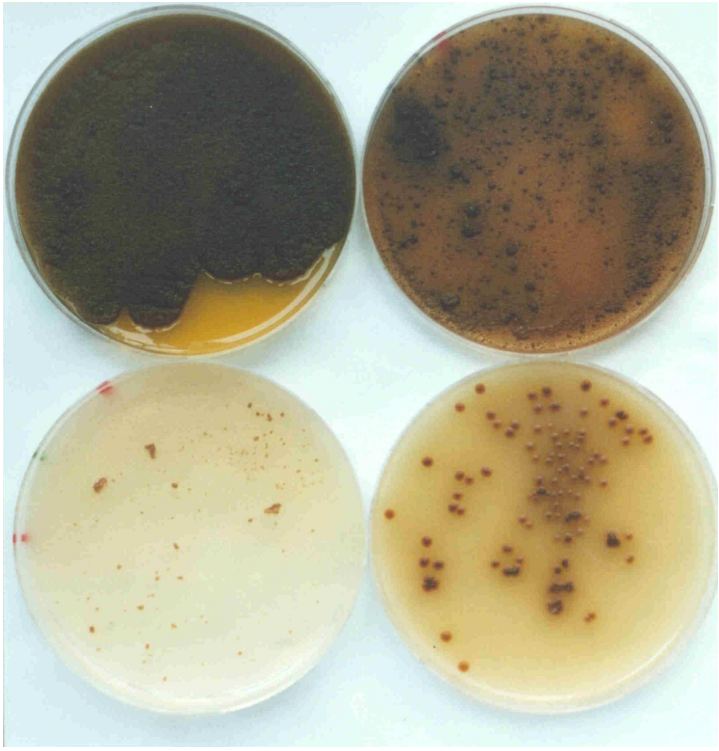
Glu	Ara	Suc	Xyl	Ino	Man	Fru	Rha	Raf	Cel
+	+	+	+	+	+	+	+	+	+

Enzymes:

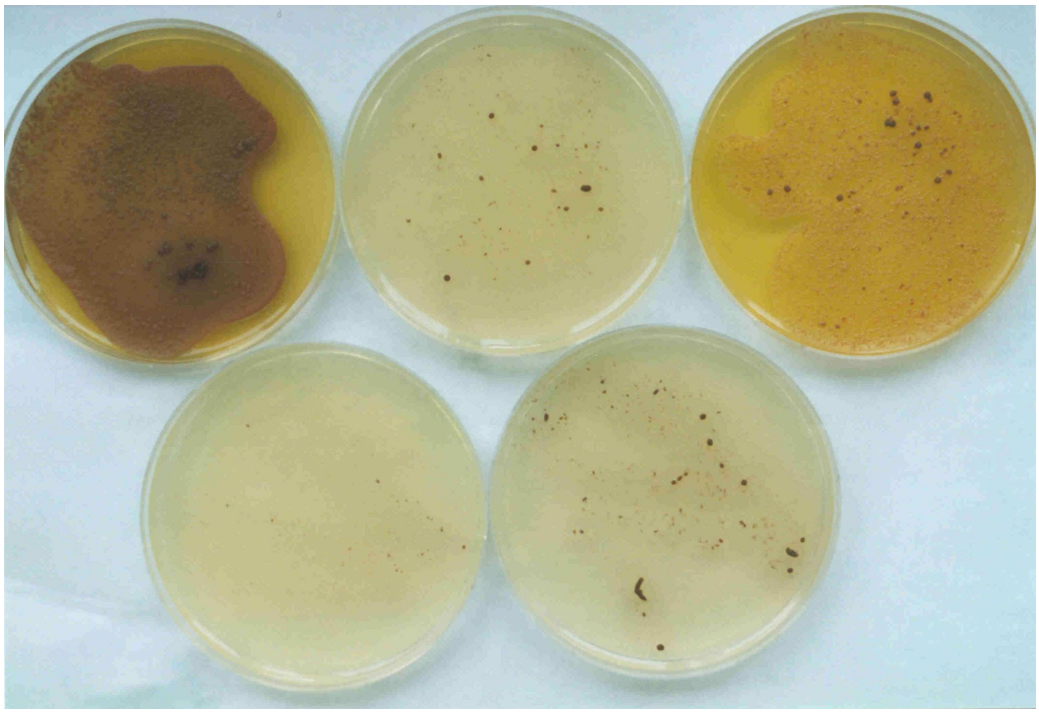
Gel	Cit	Ure	Arg	Onp	Trp	Lys	Odc	VP	Ind	H2S
+	-	-	-	+	-	-	-	(+)	-	-

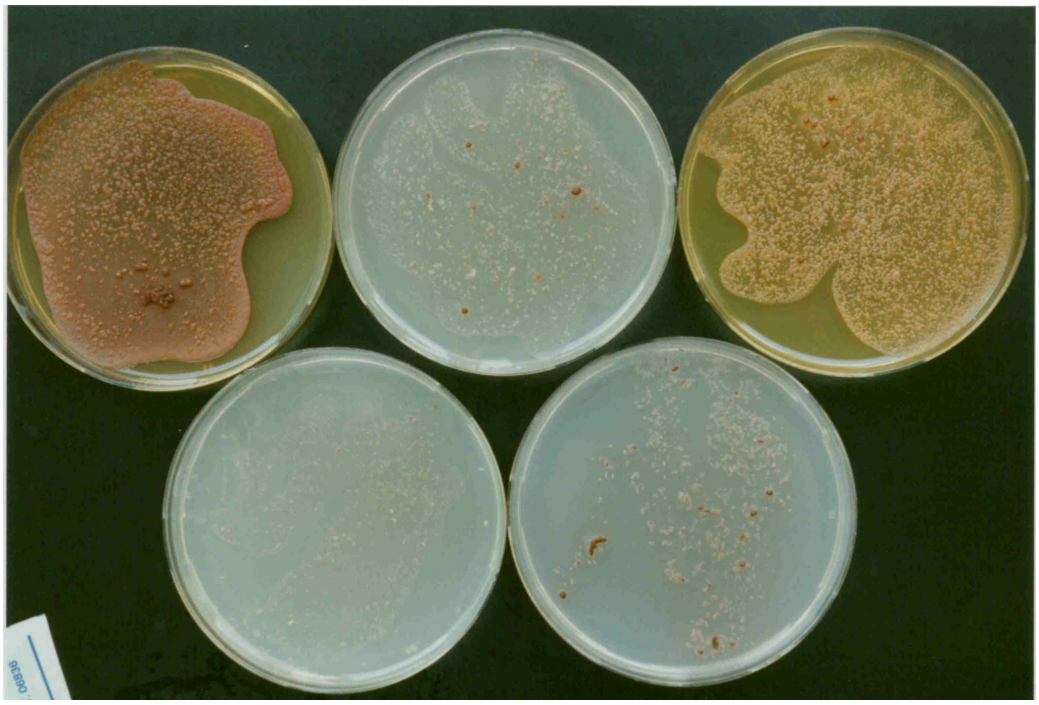
2- 3- 4+ 5- 6+ 7+ 8- 9+ 10- 11- 12- 13- 14- 15- 16+ 17+ 18+ 19- 20-



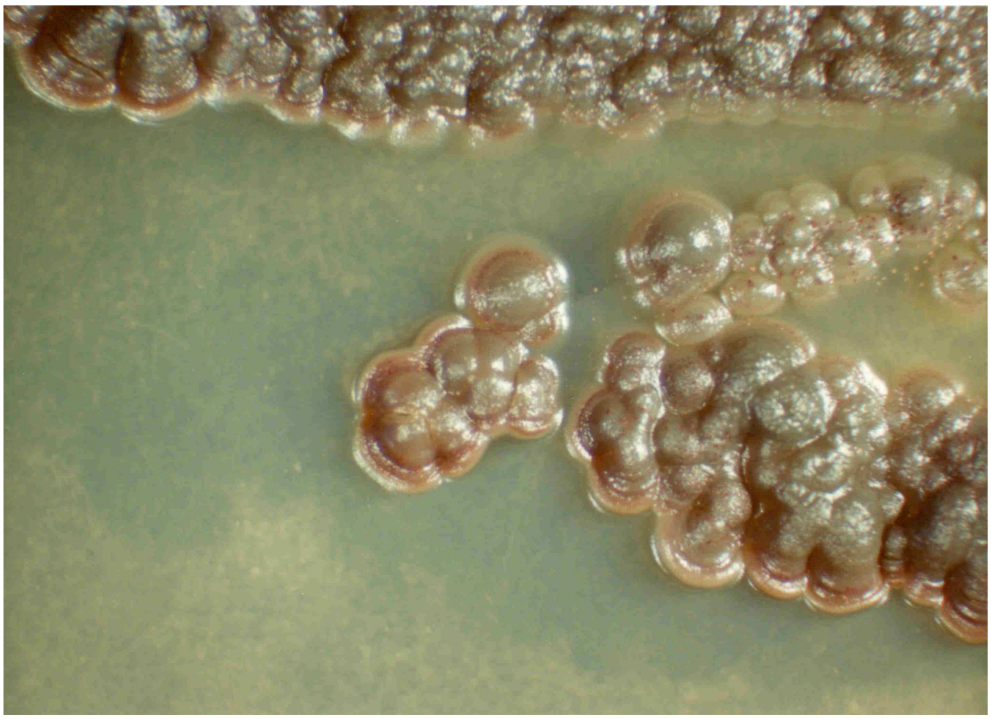


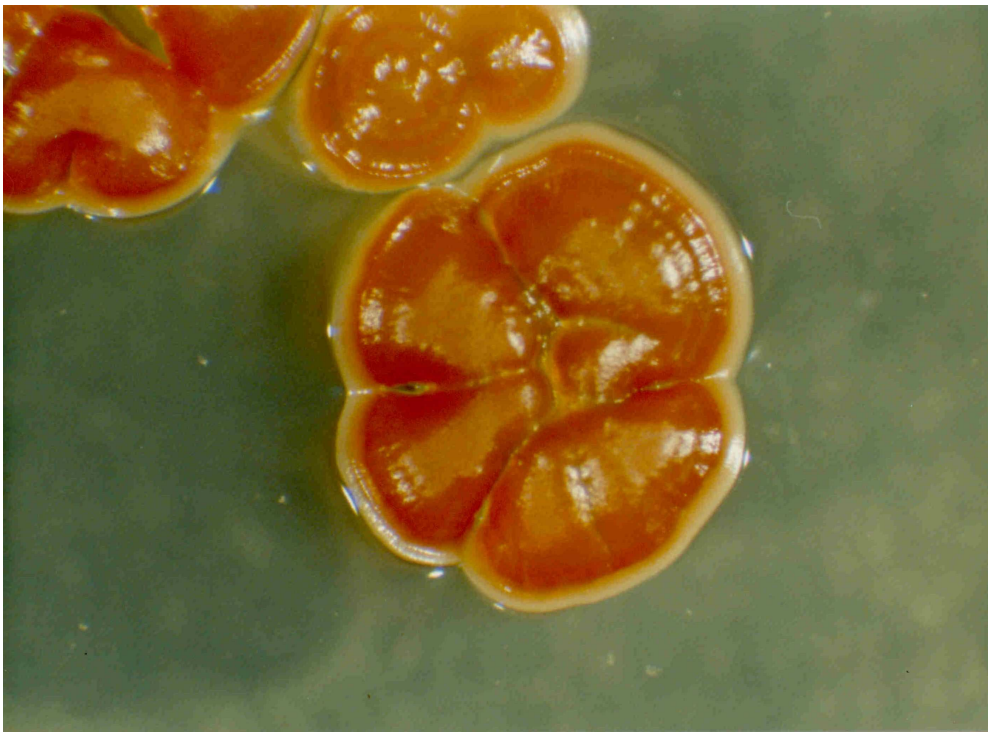
Microbispora rosea* subsp. *rosea
A and B – Agar plates medium 5265, 5315, 5317 and 5323



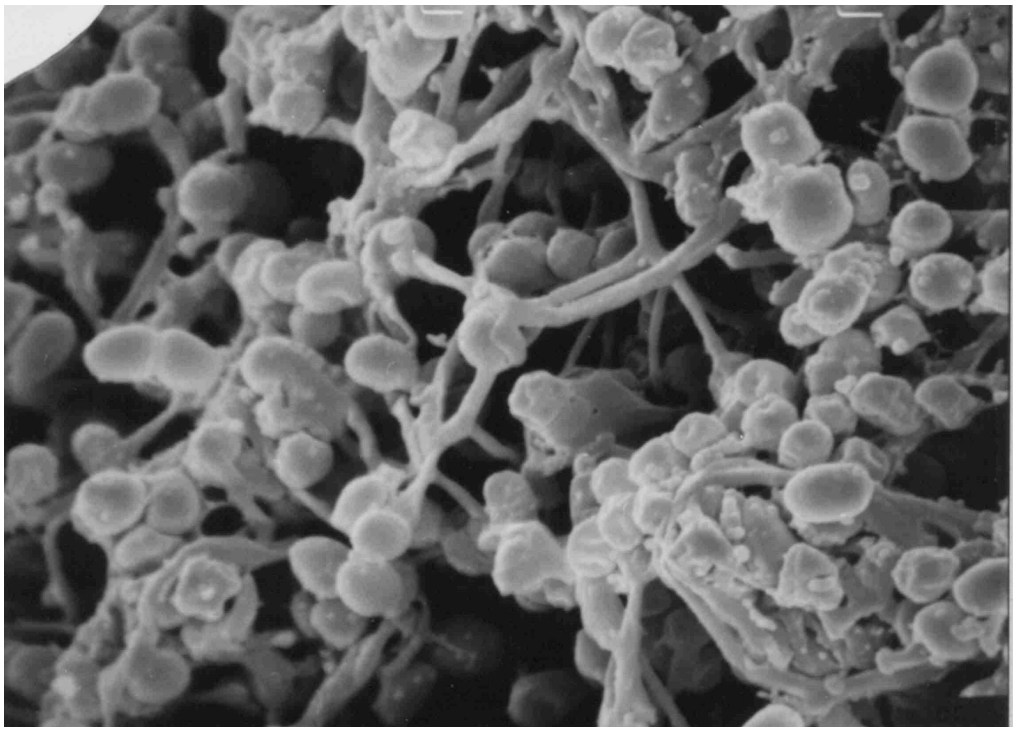


Microbispora rosea* subsp. *rosea
C and D – Agar plates medium 5006, 5318, 5322, 5337 with and without tyrosine





Microbispora rosea* subsp. *rosea
E – Colony detail on medium 5265
F – Colony detail on medium 5323



Microbispora rosea* subsp. *rosea
G – Colony detail on medium 5294
H – Spore pairs and smooth spore surface in SEM (x 5.000)