



**Ministry of Jihad-E-Agriculture  
Agricultural Research Education and Extension Organization (AREEO)  
Soil and Water Research Institute (SWRI)**

**Culture Collection WFCC 891  
Soil Biology Department**

**CATALOGUE OF CULTURES**

# **Culture Collection of Soil Microorganisms (CCSM)**

**First Edition  
2018**

سرشناسه	: اسدی رحمانی، هادی، 1348-
عنوان و نام پدیدآور	Asadi Rahmani, Hadi Culture Collection of Soil Microorganisms (CCSM): Catalogue : of Cultures/ Hadi Asadi Rahmani and Ashraf Esmailizad.
مشخصات نشر	: کرج: موسسه تحقیقات خاک و آب، 1397 = 2018 م.
مشخصات ظاهری	: 49 ص.: جدول.
شابک	: 978-600-98070-6-2
وضعیت فهرست نویسی	: فیبا
پادداشت	: انگلیسی.
آوانویسی عنوان	: کالچر کالکشن ...
موضوع	: خاک -- میکروب شناسی
موضوع	Soil Microbiology :
شناسه افزوده	: اسمعیلی زاد، اشرف، 1355-
شناسه افزوده	Esmailizad, Ashraf :
شناسه افزوده	: موسسه تحقیقات خاک و آب
شناسه افزوده	Soil and Water Research Institute :
رده بندی کنگره	: 1397 52 الف/111 QR
رده بندی دیویی	: 579/1757
شماره کتابشناسی ملی	: 5474517

**Title:** Culture Collection of Soil Microorganisms (CCSM)

**Authors:** Hadi Asadi Rahmani and Ashraf Esmailizad

**Publisher:** Soil and Water Research Institute

**Publication Manager:** Zahra Mohammadi

**Cover design and layout:** Sayed Hormoz Sajjadi

**Paging:** Samane Pourmansour

**Printing time:** first - 2018

**ISBN:** 978-600-98070-6-2

**Counters:** .....

**Address:** Soil and Water Research Institute, Late Imaam Khimeini Blvd,  
Meshkindasht Road, Standard Square, Karaj, Iran

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at K97-19 on 22/11/2018.**

It is possible to quote the contents of the source.

# **Culture Collection of Soil Microorganisms (WFCC)**

**Culture Collection WFCC 891**

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## **FOREWORD**

Microbial culture collections are genetic resources of different environmental microorganisms and play a vital role in conservation of biological diversity. These collections offer microbiological services to academics, researchers and the industrial sectors as well.

In Iran, research activities related to applied aspects of soil biology started in the middle of the 1990s with the establishment of the Soil Biology Department at the Soil and Water Research Institute (SWRI).

The Culture Collection of Soil Microorganisms (CCSM) started depositing rhizobial strains isolated from root nodules of legume crops in 1995. This research was spearheaded by SWRI. The CCSM developed throughout the past two decades and today maintains more than 1000 culture deposits. CCSM is the major collection providing microbial cultures for researchers, educators and the biofertilizer industry in Iran.

I have to say thank you to all of my colleagues in the Soil Biology Department for our success. Special thanks go out to Dr. H. Asadi Rahmani for his supervision of this project.

**Kambiz Bazargan, Ph.D.**

**Director General**

**Soil and Water Research Institute**

## **PREFACE TO THE FIRST EDITION**

It is an honor to have the catalogue of Culture Collection of Soil Microorganisms (CCSM) published. CCSM, a governmental collection held at the Soil and Water Research Institute (SWRI), serves as the only of soil microorganisms in Iran. It is also a member of the World Federation for Culture Collections (WFCC) with the registration number 891.

Soils harbor a diverse array of microorganisms. Soil microbes have been continuously studied for their potential to increase crop yield, soil nutrient cycling, environmental bioremediation, and bio-control of plant pathogens.

Research on soil microorganisms in SWRI began in 1995 when we started to isolate nitrogen-fixing rhizobia from root nodules of different legume crops. In the following years, bacterial and fungal isolates from different genera were isolated and maintained in our laboratory. These isolates are very important from agronomic perspective as they have positive impact on nutrient availability in soil, crop growth and yield.

The future availability of this collection for research and academic users necessitates safe maintenance of the cultures. The collection began as a specialized research collection, entirely dependent to the research projects of the Department of Soil Biology. CCSM developed in terms of services, the number of deposits and became a member of WFCC in 2006. Today, the collection holds more than 1000 cultures of soil bacteria and fungi.

We maintain these very important microbial cultures by storing them in various ways. Those include agar slants, freeze dried ampoules and submersion in glycerol at -70 °C.

I am very grateful for the CCSM staff that devoting their time and effort to this undertaking. Staff members include. A. Esmailizad, Dr. H. Kari Dolatabad, N. Alizadeh and Kh. Arbabi. I also wish to sincerely thank those colleagues who donated cultures to the CCSM. Donors include Dr. K. Khavazi, Dr. A. Asgharzadeh, Dr. H. Besharati, Dr. H. Khosravi, Dr. F. Rejali, Dr. A. R. Fallah, and M. Afshari Aliabad. I remain personally indebted to those colleagues who were dedicated to working in the

Department of Soil Biology as experts including V. Hemmati, M. Shamshiripour, and A. Otadi.

For more information regarding our services or to learn more about a particular strain please visit our website at [www.swri.ir](http://www.swri.ir) or feel free to direct any inquiries to Department of Soil Biology.

**Hadi Asadi Rahmani, Ph.D.**  
**Director and Curator of CCSM**

## CATALOGUE GUIDELINES

- A. Scientific names are alphabetically arranged
- B. The identification of bacteria is based on the biochemical methods and 16S rDNA sequencing
- C. Each strain is listed as follows:
  - Deposit or scientific name
  - CCSM accession number
  - Source
  - Biosafety level
  - Recommended culture medium
  - Recommended incubation temperature
- D. Abbreviations

MRS	de Man, Rogosa and Sharpe
NA	Nutrient Agar
RC	Rodriguez-Caceres
YMA	Yeast Manitol Agar



## Summary of bacteria collected in CCSM

Representative Genus	Representative species	No. of strains	Page
<i>Achromobacter</i>	<i>marplatensis</i>	1	7
	<i>xylosoxidans</i>	1	7
<i>Acinetobacter</i>	sp.	1	7
<i>Agrobacterium</i>	sp.	4	7
<i>Alcaligenes</i>	<i>faecalis</i>	1	7
<i>Arthrobacter</i>	<i>agilis</i>	1	7
	sp.	1	7
<i>Azorhizobium</i>	<i>caulinodans</i>	1	8
<i>Azospirillum</i>	<i>brasilense</i>	4	8
	<i>lipoferum</i>	4	8
	<i>zeae</i>	2	8
	sp.	3	8
<i>Azotobacter</i>	<i>chroococcum</i>	7	8
	<i>salinestrans</i>	9	9
	sp.	1	9
<i>Bacillus</i>	<i>aerophilus</i>	1	10
	<i>amyloliquefaciens</i>	3	10
	<i>endophyticus</i>	1	10
	<i>firmus</i>	1	10
	<i>fordii</i>	2	10
	<i>humi</i>	1	10
	<i>licheniformis</i>	3	10
	<i>megaterium</i>	4	10
	<i>pumilus</i>	2	10
	<i>safensis</i>	1	10
	<i>siamensis</i>	1	10
	<i>sonorensis</i>	1	10
	<i>subtilis</i>	17	11
	<i>tequilensis</i>	3	11
	<i>thuringiensis</i>	1	11
	<i>velezensis</i>	17	11
	sp.	1	12
<i>Bradyrhizobium</i>	<i>japonicum</i>	55	12
	sp.	27	15
<i>Brevibacillus</i>	<i>parabrevis</i>	1	18
<i>Brevibacterium</i>	<i>halotolerans</i>	1	18
<i>Cellulosimicrobium</i>	<i>funkei</i>	1	18
<i>Chryseobacterium</i>	<i>ginsenosidimutans</i>	5	18
	<i>lathyri</i>	8	18
	<i>piperi</i>	2	19
	<i>taiwanense</i>	1	19
<i>Citrobacter</i>	<i>amalonaticus</i>	3	19
<i>Cupriavidus</i>	sp.	3	19
<i>Dyadobacter</i>	<i>fermentans</i>	2	19
<i>Enterobacter</i>	<i>cloacae</i>	1	20
	<i>hormaechei</i>	1	20
	<i>xiangfangensis</i>	2	20
	sp.	5	20

Representative Genus	Representative species	No. of strains	Page
<i>Enterococcus</i>	sp.	1	20
<i>Halothiobacillus</i>	<i>halophilus</i>	1	20
	<i>hydrothermalis</i>	1	20
	<i>kellyi</i>	1	20
	<i>neapolitanus</i>	3	21
<i>Klebsiella</i>	<i>aerogenes</i>	1	21
<i>Kocuria</i>	<i>rosea</i>	1	21
<i>Lactobacillus</i>	<i>buchneri</i>	1	21
	<i>paracasei</i>	1	21
	<i>plantarum</i>	1	21
	<i>rhamnosus</i>	1	21
	<i>parafarraginis</i>	1	21
<i>Lysinibacillus</i>	<i>fusiformis</i>	1	21
<i>Mesorhizobium</i>	<i>ciceri</i>	3	22
	sp.	1	22
<i>Microbacterium</i>	sp.	2	22
<i>Micrococcus</i>	<i>luteus</i>	1	22
<i>Novosphingobium</i>	<i>aromaticivorans</i>	1	22
<i>Ochrobactrum</i>	<i>anthropi</i>	2	22
	<i>intermedium</i>	1	23
	<i>thiophenivorans</i>	1	23
<i>paenibacillus</i>	<i>borealis</i>	1	23
	<i>ginsengarvi</i>	1	23
	<i>lautus</i>	1	23
	<i>polymyxa</i>	1	23
	sp.	1	23
<i>Pantoea</i>	<i>agglomerans</i>	3	23
	<i>ananatis</i>	3	23
	<i>brenneri</i>	1	23
	<i>septica</i>	1	23
<i>Paraburkholderia</i>	<i>sediminicola</i>	1	24
<i>Pedobacter</i>	<i>duraquae</i>	2	24
<i>Pseudomonas</i>	<i>aeruginosa</i>	7	24
	<i>azotoformans</i>	1	24
	<i>brassicacearum</i>	3	24
	<i>chengduensis</i>	1	25
	<i>fluorescens</i>	74	25
	<i>frederiksbergensis</i>	2	30
	<i>gessardii</i>	1	30
	<i>granadensis</i>	1	30
	<i>helmanticensis</i>	1	30
	<i>koreensis</i>	5	30
	<i>mohnii</i>	1	30
	<i>monteilii</i>	1	30
	<i>protegens</i>	1	30
	<i>putida</i>	90	30
	sp.	62	36
<i>Rahnella</i>	<i>aquatilis</i>	9	40

Representative genus	Representative species	No. of strains	Page
<i>Rhizobium</i>	<i>etli</i> bv. <i>phaseoli</i>	15	40
	<i>leguminosarum</i> bv. <i>phaseoli</i>	63	41
	<i>leguminosarum</i> bv. <i>viciae</i>	7	45
	<i>radiobacter</i>	14	46
<i>Sinomonas</i>	<i>atrocyanea</i>	1	47
	sp.	1	47
<i>Sinorhizobium</i>	<i>meliloti</i>	168	47
<i>Sphingobacterium</i>	<i>mizutae</i>	1	60
<i>Sphingomonas</i>	<i>koreensis</i>	1	60
<i>Staphylococcus</i>	<i>warneri</i>	1	61
<i>Stenotrophomonas</i>	<i>rhizophila</i>	2	61
	sp.	1	61
<i>Streptomyces</i>	<i>coelicoflavus</i>	1	61



# **LIST OF BACTERIA**



Deposit name	CCSM number	Origin, Isolated from	Biosafety level	Medium, Optimum growth temp.
<i>Achromobacter marplatensis</i>	CCSM-B 00258	- Manure	2	NA, 28 °C
<i>Achromobacter xylosoxidans</i>	CCSM-B 00276	-	2	NA, 28 °C

Deposit name	CCSM number	Origin, Isolated from	Biosafety level	Medium, Optimum growth temp.
<i>Acinetobacter</i> sp.	CCSM-B 00323	-	2	NA, 28 °C

Deposit name	CCSM number	Origin, Isolated from	Biosafety level	Medium, Optimum growth temp.
<i>Agrobacterium</i> sp.	CCSM-B 01333	- Soil	-	YMA, 28 °C
<i>Agrobacterium</i> sp.	CCSM-B 01334	- Soil	-	YMA, 28 °C
<i>Agrobacterium</i> sp.	CCSM-B 01335	- Soil	-	YMA, 28 °C
<i>Agrobacterium</i> sp.	CCSM-B 01336	- Soil	-	YMA, 28 °C

Deposit name	CCSM number	Origin, Isolated from	Biosafety level	Medium, Optimum growth temp.
<i>Alcaligenes faecalis</i>	CCSM-B 00424	-	1	NA, 28 °C

Deposit name	CCSM number	Origin, Isolated from	Biosafety level	Medium, Optimum growth temp.
<i>Arthrobacter agilis</i>	CCSM-B 01450	- Soil	1	NA, 28 °C
<i>Arthrobacter</i> sp.	CCSM-B 00332	Shazand, Markazi, Iran, Soil	1	NA, 28 °C

Deposit name	CCSM number	Origin, Isolated from	Biosafety level	Medium, Optimum growth temp.
<i>Azorhizobium caulinodans</i>	CCSM-B 00248	-	1	YMA, 28 °C

Deposit name	CCSM number	Origin, Isolated from	Biosafety level	Medium, Optimum growth temp.
<i>Azospirillum brasilense</i>	CCSM-B 00231	-	1	RC, 35 °C
<i>Azospirillum brasilense</i>	CCSM-B 00501	Esfahan, Iran, Soil	1	RC, 35 °C
<i>Azospirillum brasilense</i>	CCSM-B 00502	Esfahan, Iran, Soil	1	RC, 35 °C
<i>Azospirillum brasilense</i>	CCSM-B 00506	Esfahan, Iran, Soil	1	RC, 35 °C
<i>Azospirillum lipoferum</i>	CCSM-B 00232	-	1	RC, 35 °C
<i>Azospirillum lipoferum</i>	CCSM-B 00443	-	1	RC, 35 °C
<i>Azospirillum lipoferum</i>	CCSM-B 00500	Esfahan, Iran, Soil	1	RC, 35 °C
<i>Azospirillum lipoferum</i>	CCSM-B 00503	Esfahan, Iran, Soil	1	RC, 35 °C
<i>Azospirillum zeae</i>	CCSM-B 00504	Esfahan, Iran, Soil	1	RC, 35 °C
<i>Azospirillum zeae</i>	CCSM-B 00505	Esfahan, Iran, Soil	1	RC, 35 °C
<i>Azospirillum</i> sp.	CCSM-B 00284	-	1	RC, 35 °C
<i>Azospirillum</i> sp.	CCSM-B 00299	-	1	RC, 35 °C
<i>Azospirillum</i> sp.	CCSM-B 00301	-	1	RC, 35 °C

Deposit name	CCSM number	Origin, Isolated from	Biosafety level	Medium, Optimum growth temp.
<i>Azotobacter chroococcum</i>	CCSM-B 00233	- Soil	1	Winogradsky agar, 28 °C
<i>Azotobacter chroococcum</i>	CCSM-B 00440	-	1	Winogradsky agar, 28 °C