

اگر چه از رگ گردن
تو را هر لحظه از جایی

تویی نزدیک تر با من
من سر در هوا جویم

صائب



ریاست جمهوری
معاونت علمی و فناوری
سازمان توسعه زیست فناوری

نشست تخصصی یک روزه:

زیست فناوری کویر، فرصت‌ها

jhamedi@ut.ac.ir



@javadhamedi



micbiotechnol



توانمندی های زیست فناوری اکتینوباکترهای کویرهای ایران

Biotechnological potential of Actinobacteria isolated from deserts of Iran

جواد حامدی
دانشگاه تهران

Some definitions

Science

Technology

Biotechnology

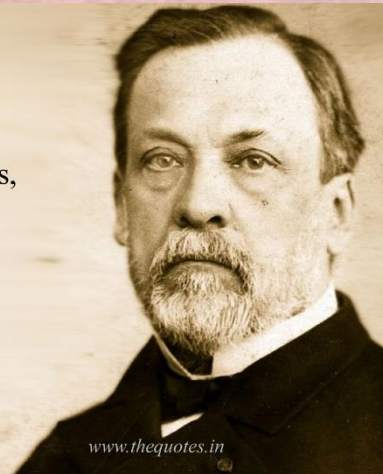
Economy

Industry

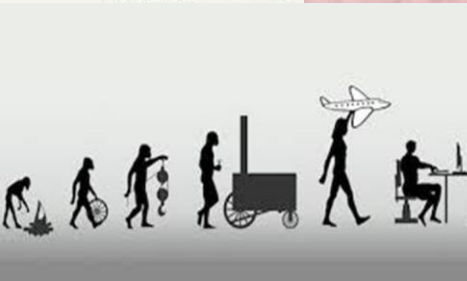
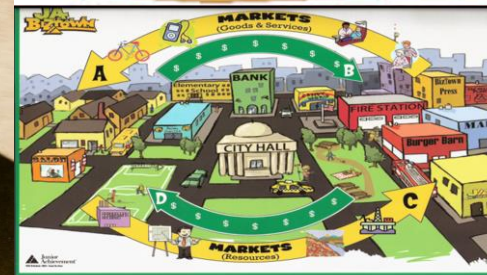


There are no such things as applied sciences,
only applications of science.

Louis Pasteur



www.thequotes.in



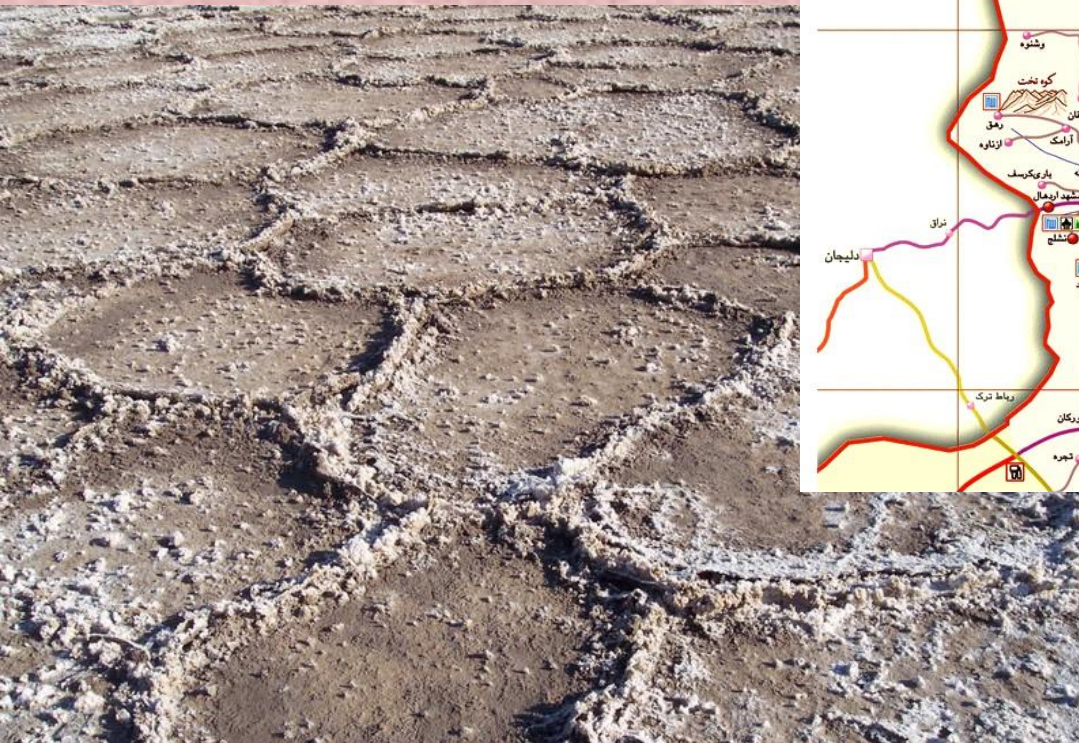
Era of microbial biotechnology

- First era: Using without knowledge (~10,000 years ago)
- Second era: Mixed culture (1884)
- Third era: Pure culture (1945)
- Fourth era: Genetic engineering (1982)
- Fifth era: (2000)
 - Diversification
 - Metabolic engineering
 - Synthetic biology

1% OF BACTERIA	=	170 BILLIONS \$
OTHER 99% OF BACTERIA		X

Maranjab Desert

- North of Aran & Bidgol, Isfahan Province



Parishan salt lake

- Shiraz province



Hormoz island

- Persian Gulf, Hormozgan Province



Namak Desert

- Qom-Semnan



Sampling

- Soil
- Water
- Rhizosphere

Pretreatments

- Air drying
- Air dring + CaCO₃
- Centrifugation
- Radio magnetic waves
- Dry heating (120 oC, 30-60 min)

Actinobacterial media

- ISP2 (Malt + yeast extract glucose agar)
- Soil extract agar
- Water agar
- Starch casein nitrate agar

Screening of activity

- Antimicrobial (*Klebsiella pneumoniae*, *Acinetobacter baumannii*, MRSA, *E. coli*, *Candida albicans*)
- Antioxidants activity
- Pigment production (dyeing)
- Plant growth promoting activity
- Anticancer activity
- Hydrolytic enzymes activity (amylase, protease, lipase, esterase, DNase)
- Exopolysaccharide production
- Antidiabetic activity
- Antivascular calcification activity
- Anti-acetylcholinesterase activity
- Anticoagulant activity
- Proangiogenic activity
- Antiangiogenic activity

Promicromonospora iranensis sp. nov., an actinobacterium isolated from rhizospheric soil

Fatemeh Mohammadipanah,^{1,2} Javad Hamedei,^{1,2} Cathrin Spröer,³ María del Carmen Montero-Calasanz,³ Peter Schumann³ and Hans-Peter Klenk³

Streptomyces zagrosensis sp. nov., isolated from soil

Fatemeh Mohammadipanah,^{1,2} Javad Hamedei,^{1,2} Cathrin Spröer,³ Manfred Rohde,⁴ María del Carmen Montero-Calasanz³ and Hans-Peter Klenk³

Saccharothrix ecbatanensis sp. nov., an actinobacterium isolated from soil

Fatemeh Mohammadipanah,^{1,2} Javad Hamedei,^{1,2} Peter Schumann,³ Cathrin Spröer,³ María del Carmen Montero-Calasanz^{3,4} and Hans-Peter Klenk^{3,4}

***Kribbella shirazensis* sp. nov., isolated from Iranian soil**

Fatemeh Mohammadipanah,^{1,2} Javad Hamedi,^{1,2} Markus Göker,³
Anne Fiebig,³ Rüdiger Pukall,³ Cathrin Spröer³ and Hans-Peter Klenk³

International Journal of Systematic and Evolutionary Microbiology (2011), 61, 1189–1194

DOI 10.1099/ijs.0.022756-0

***Nocardiopsis arvandica* sp. nov., isolated from sandy soil**

Javad Hamedi,¹ Fatemeh Mohammadipanah,¹ Gabriele Pötter,²
Cathrin Spröer,² Peter Schumann,² Markus Göker² and
Hans-Peter Klenk²

International Journal of Systematic and Evolutionary Microbiology (2010), 60, 1504–1509

DOI 10.1099/ijs.0.015339-0

***Streptomyces iranensis* sp. nov., isolated from soil**

Javad Hamedi,¹ Fatemeh Mohammadipanah,¹ Hans-Peter Klenk,²
Gabriele Pötter,² Peter Schumann,² Cathrin Spröer,² Mathias von Jan²
and Reiner M. Kroppenstedt²

ORIGINAL ARTICLE

Simultaneous anti-diabetic and anti-vascular calcification activity of *Nocardia* sp. UTMC 751

F. Salimi^{1,2}, S. Jafari-Nodooshan³, N. Zohourian^{1,2}, S. Kolivand³ and J. Hamed^{1,2}

Journal of
Applied Microbiology



Journal of Applied Microbiology ISSN 1364-5072

ORIGINAL ARTICLE

Isolation and screening of rare *Actinobacteria*, a new insight for finding natural products with antivasular calcification activity

F. Salimi^{1,2}, J. Hamed^{1,2}, E. Motevaseli³ and F. Mohammadipanah^{1,2}

Iranian Journal of Pharmaceutical Research (2019), 18 (1): 459-468

Received: December 2016

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Original Article

Coexistence of Anticoagulant and Anti-vascular Calcification Activities in *Kribbella* sp. UTMC 267 Metabolites

Fatemeh Salimi^{a,b}, Javad Hamed^{a,b*}, Elaheh Motevaseli^{c*} and Fatemeh Mohammadipanah^{a,b}

ORIGINAL ARTICLE

Isolation and screening of proangiogenic and antiangiogenic metabolites producing rare actinobacteria from soil

Y. Azarakhsh¹, F. Mohammadipanah^{1,2} , S.M. Nassiri³ , V. Siavashi³ and J. Hamed^{1,2}

BIOPRESERVATION AND BIOBANKING

Volume 15, Number 5, 2017

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DOI: 10.1089/bio.2017.0046

ORIGINAL ARTICLE

Protective Effects of Cryoprotectants and Lyoprotectants on the Survival of Persipeptide Producing *Streptomyces zagrosensis* UTMC 1154

Fatemeh Mohammadipanah,^{1,2} Leila Parvizi,^{1,2} Javad Hamed^{1,2} and Farzaneh Azizmohseni³

Alkaline Protease from *Nocardiopsis arvandica* UTMC 1492 Isolated from Saline Soil with the Ability to Produce Bioactive Protein Hydrolysate

INDUSTRIAL BIOTECHNOLOGY © MARY ANN LIEBERT, INC. • VOL. 14 NO. 1 • FEBRUARY 2018

Fatemeh Mohammadipanah,¹ Farid Ghelichkhani,¹ Khosro Khajeh,² and Javad Hamed¹

enzymes.³ These proteases are naturally extracellular
fore, downstream processing of the enzyme is easier co

Molecular characterization and periplasmic expression of the *nlp* gene of *Streptomyces cyaneofuscatus* UTMC 2101 in *Escherichia coli*

Javad Hamedī • Reyhaneh Papiran

Int. J. Environ. Res., 9(2):475-480, Spring 2015
ISSN: 1735-6865

**Isolation of Extremely Heavy Metal Resistant Strains of Rare Actinomycetes
from High Metal Content Soils in Iran**

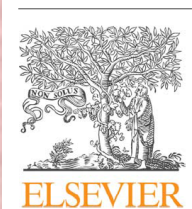
Hamedī, J.^{1,2*}, Dehghani, M.^{1,2} and Mohammadianah, F.^{1,2}

 Iranian
Journal of
Microbiology

Volume 7 Number 1 (February 2015) 23-30

Molecular, chemical and biological screening of soil actinomycete isolates in seeking bioactive peptide metabolites

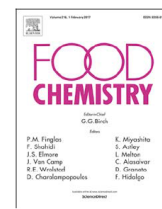
Javad Hamedī^{1,2}, Somaye Imanparast^{1,2}, Fatemeh Mohammadipanah^{1,2}



Contents lists available at ScienceDirect

Food Chemistry

journal homepage: www.elsevier.com/locate/foodchem



Enzymatic esterification of acylglycerols rich in omega-3 from flaxseed oil by an immobilized solvent-tolerant lipase from *Actinomadura sediminis* UTMC 2870 isolated from oil-contaminated soil

Somaye Imanparast^{a,b,c}, Javad Hamedia^{a,b,*}, Mohammad Ali Faramarzi^{c,*}

Bioorganic & Medicinal Chemistry 20 (2012) 335–339



Contents lists available at SciVerse ScienceDirect

Bioorganic & Medicinal Chemistry

journal homepage: www.elsevier.com/locate/bmc



Persipeptides A and B, two cyclic peptides from *Streptomyces* sp. UTMC 1154

Fatemeh Mohammadipanah^{a,b}, Josphat Matasyoh^a, Javad Hamedia^b, Hans-Peter Klenk^c, Hartmut Laatsch^{a,*}

IEEE TRANSACTIONS ON NANOBIOSCIENCE, VOL. 14, NO. 4, JUNE 2015

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Green Synthesis of Gold Nanoparticles by a Metal Resistant *Arthrobacter nitroguajacolicus* Isolated From Gold Mine

Alireza Dehnad, Javad Hamedia*, Fatemeh Derakhshan-Khadivi, and Rahib Abuşov

Screening of pigment producing activity and using in dyeing of wool, cotton and silk

- Isolation of 103 actinobacteria isolates from Maranjab Desert (Faezeh Ramezani, 1397)
- Pigment extraction by acetone and hexan



wool



R5



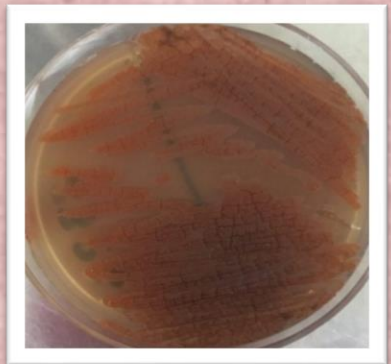
R6



R7



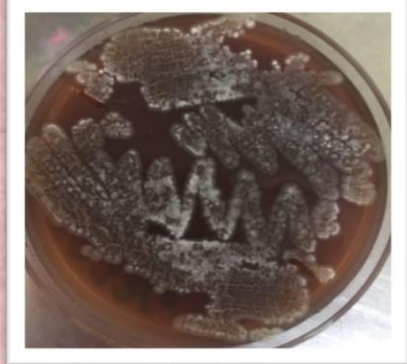
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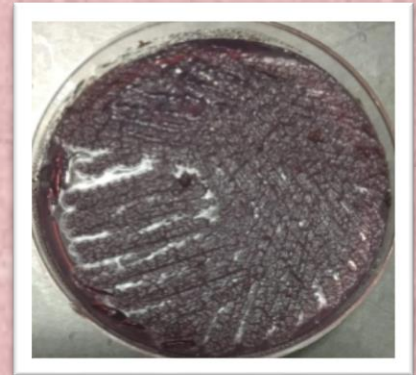
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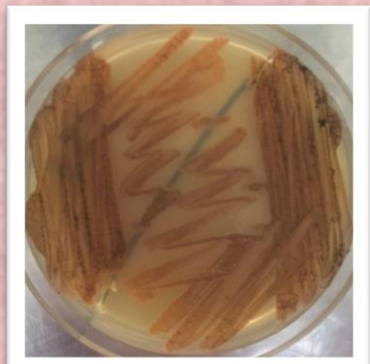
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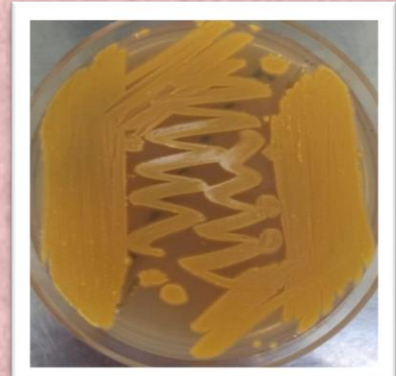
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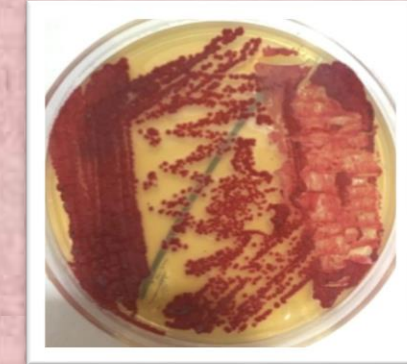
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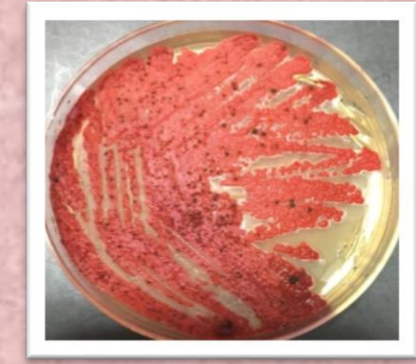
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R14

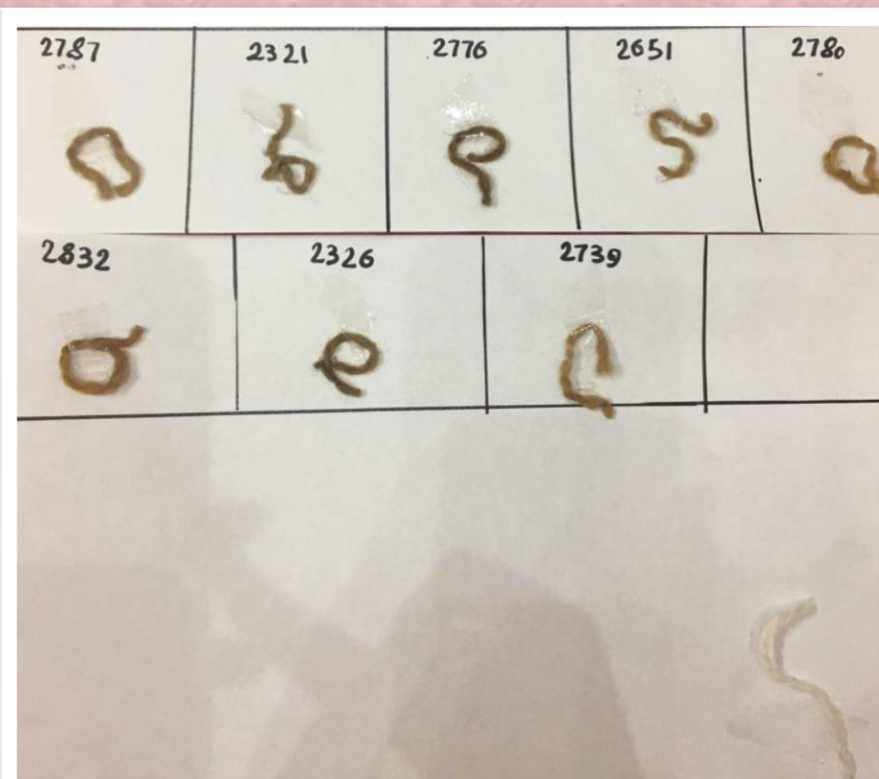


R15

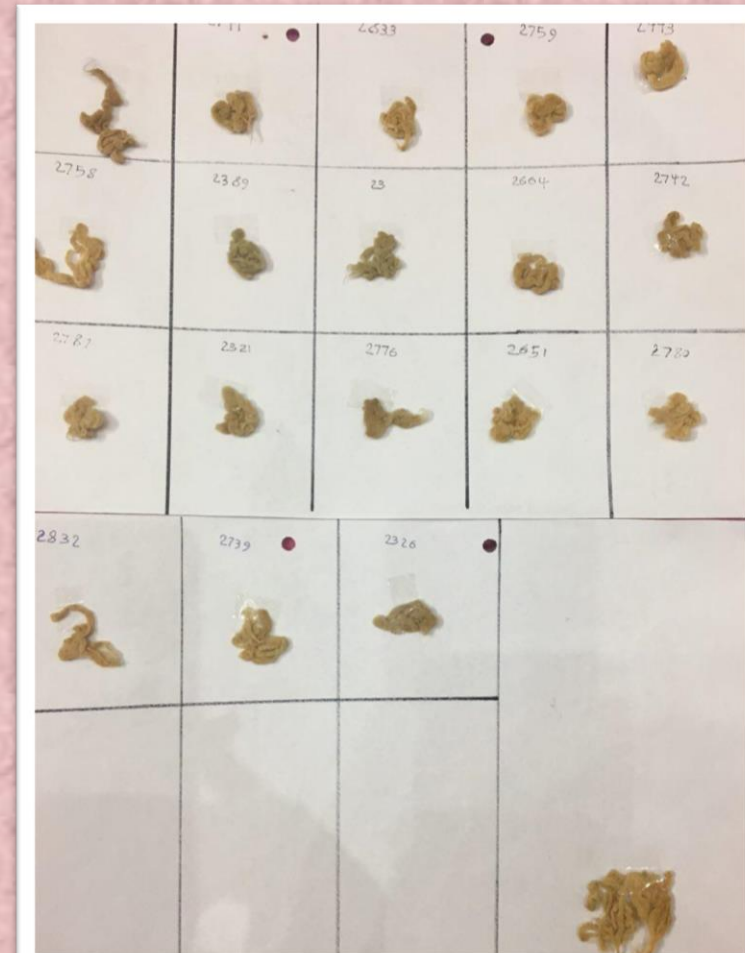
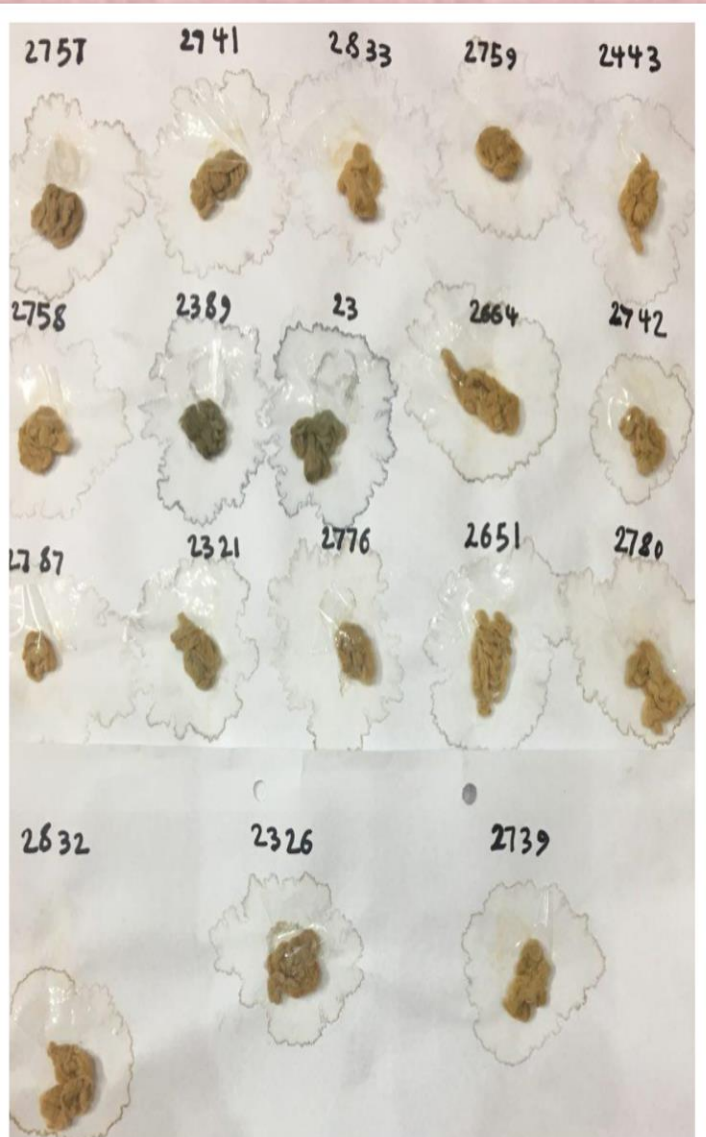


R16

Wool dyeing by the pigments of actinobacteria



cotton dyeing by the pigments of actinobacteria



Thank you for your attention



[Email: jhamedi@ut.ac.ir](mailto:jhamedi@ut.ac.ir)



@javadhamedi



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