

Journal of International Dental and Medical Research

COUNTRY

Turkey



Universities and research institutions in Turkey



Media Ranking in Turkey

SUBJECT AREA AND CATEGORY

Dentistry

└ Dentistry (miscellaneous)

PUBLISHER

Ektodermal Displazi Grubu

H-INDEX

17

PUBLICATION TYPE

Journals

ISSN

1309100X

COVERAGE

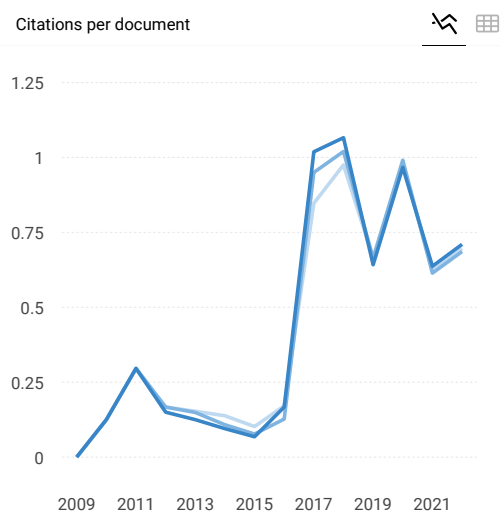
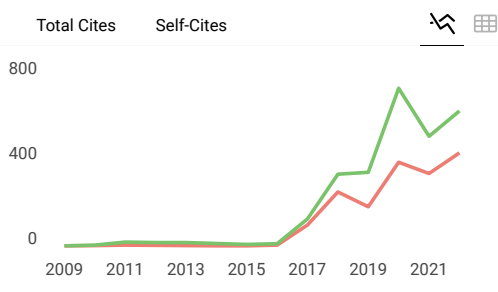
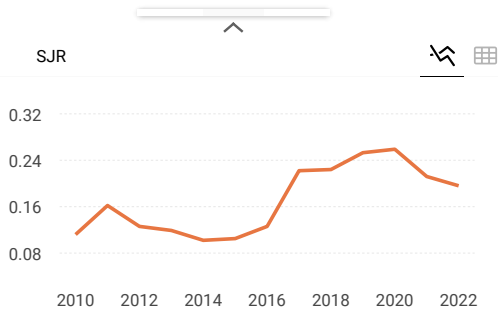
2009-2023

SCOPE

Information not localized

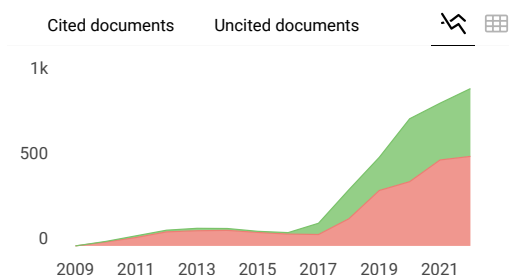
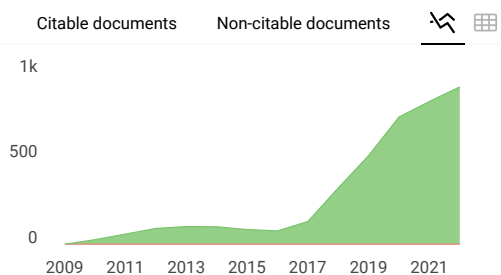
FIND SIMILAR JOURNALS ?

<p>1 Journal of International Oral Health IND</p> <p>40% similarity</p>	<p>2 Pesquisa Brasileira em Odontopediatria e Clinica BRA</p> <p>38% similarity</p>	<p>3 Journal of International Society of Preventive and IND</p> <p>37% similarity</p>	<p>4 Indian Journal of Dental Research IND</p> <p>36% similarity</p>
---	---	---	--



- Cites / Doc. (4 years)
- Cites / Doc. (3 years)
- Cites / Doc. (2 years)





Journal of International Dental and Medical...

Q3 Dentistry (miscellaneous) best quartile

SJR 2022 0.2

powered by scimagojr.com

← Show this widget in your own website

Just copy the code below and paste within your html code:

```
<a href="https://www.scimag
```

SCImago Graphica

Explore, visually communicate and make sense of data with our **new data visualization tool.**



Metrics based on Scopus® data as of April 2023

R Ricca Chairunnisa 1 month ago

Greetings, i am a chairperson of dental conference that will be held on May 2024, we would like to have a collaboration with JIDMR for publication. Is special issue possible?

reply

I izzet yavuz 2 weeks ago

Dear author,

You can keep in touch with JIDMR secretary via jidmreditor@outlook.com .

Sincerely yours.

Melanie Ortiz 1 month ago

Dear Ricca,
Thank you for contacting us.

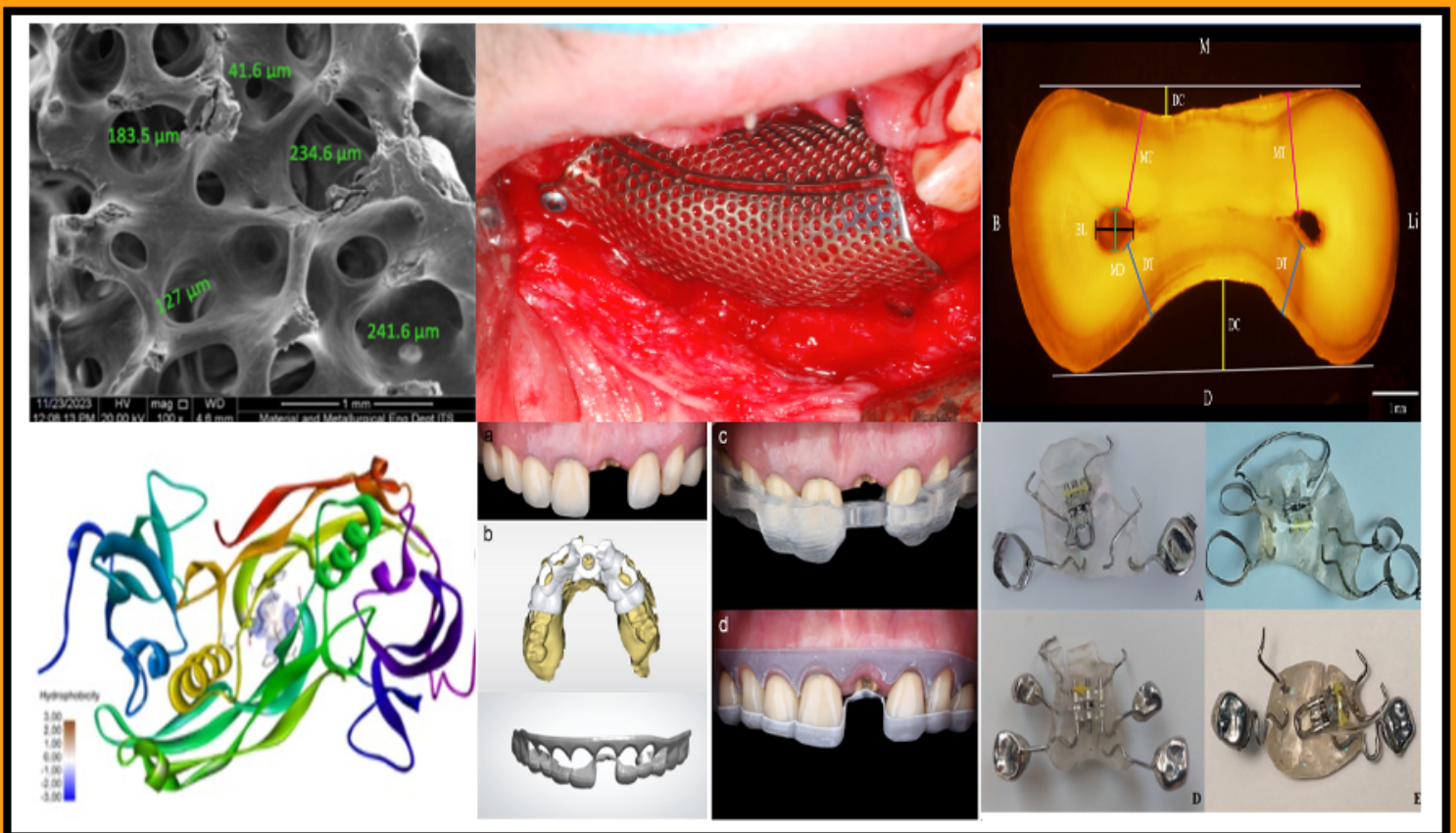
SCImago Team

Journal of

International

Dental and Medical

Research



2024 - Vol. 17 - No. 1

<http://www.jidmr.com>



Journal of International Dental and Medical Research



Editorial Board of JIDMR

Prof. Dr. Izzet YAVUZ

Editor-in-Chief and General Director

Advisory Board

Prof. Dr. Refik ULKU Editor for Medicine

Prof. Dr. Zulkuf AKDAG Editor for Biomedical Research

Prof. Dr. Ozkan ADIGUZEL Associate Editor

Gajanan Kiran KULKARNI (CANADA)

Betul KARGUL (TURKEY)

Diah Ayu MAHARANI (INDONESIA)

Francisco Cammarata-Scalisi (Venezuela)

Myroslav Goncharuk-Khomyn (UKRAINE)

Ferranti WONG (UK)

Zeki AKKUS (TURKEY)

Michele CALLEA (ROME, ITALY)

Zelal ULKU (TURKEY)

Moschos A. PAPAD

Lindawati S KUSDH

Yasemin YAVUZ (TU

Yuliya MAKEDONO

Nik Noriah Nik HUS

Editorial Board

Abdel Fattah BADAWI
(EGYPT)

Abdurrahman ONEN
(TURKEY)

Ahmet YALINKAYA (TURKEY)

Ahmet DAG (TURKEY)

Ali Al-ZAAG (IRAQ)

Ali BUMIN (TURKEY)

Guvenc BASARAN
(TURKEY)

Guyen ERBIL
(TURKEY)

Halimah AWANG
(MALAYSIA)

Halit AKBAS
(TURKEY)

Nezahat AKPOLAT
(TURKEY)

Nihal HAMAMCI
(TURKEY)

Nik Noriah Nik HUSSEIN
(MALAYSIA)

Nicola Pranno (ROME)

Ali FADEL (EGYPT)	Heloisa Fonseca MARA0 (BRAZIL)	Nurten AKDENIZ (TURKEY)
Ali GUR (TURKEY)		
Ali Riza ALPOZ (TURKEY)	Hilal TURKER (TURKEY)	Nurten ERDAL (TURKEY)
Ali Riza Tunçdemir (TURKEY)	Huseyin ASLAN (TURKEY)	Orhan TACAR (TURKEY)
Allah Bakhsh HAAFIZ (USA)		Ozant ONCAG (TURKEY)
Alpaslan TUZCU (TURKEY)	Igor BELYAEV (SWEDEN)	Ozgur UZUN (TURKEY)
Alpen ORTUG (TURKEY)	Ilhan INCI (ZURICH)	Ozkan ADIGUZEL (TURKEY)
Armelia Sari		Rafat Ali SIDDIQUI (PAKISTAN)
WIDYARMAN (INDONESIA)	Ilker ETIKAN (TURKEY)	Refik ULKU (TURKEY)
Ashish AGGARWAL (INDIA)	Isil TEKMEK (TURKEY)	Sabiha Zelal ULKU (TURKEY)
Ayşe GUNAY (TURKEY)	Isin ULUKAPI (TURKEY)	Sabri BATUN (TURKEY)
Aziz YASAN (TURKEY)		Sadullah KAYA (TURKEY)
Awiruth KLAISIRI (THAILAND)	Jalen DEVECIOGLU KAMA (TURKEY)	Saul Martins PAIVA (BRAZIL)
Balabramanian MADHAN (INDIA)	Kemal CIGDEM (TURKEY)	Sedat AKDENIZ (TURKEY)
Benik HARUTUNYAN (ARMENIA)	Kemal NAS (TURKEY)	Seher GUNDUZ ARSLAN (TURKEY)
Betul KARGUL (TURKEY)	Kewal KRISHAN (INDIA)	Selahattin ATMACA (TURKEY)
Betul URREHMAN (UAE)	King Nigel MARTYN(HONG KONG, CHINA)	Selahattin TEKES (TURKEY)
Bugra OZEN (TURKEY)	Kursat ER (TURKEY)	Serdar ERDINE (TURKEY)
Carlos Menezes AGUIAR (BRAZIL)	Levent ERDINC (TURKEY)	Serdar ONAT (TURKEY)
Cemil SERT (TURKEY)	Luca TESTARELLI (ROME)	Sergio Adriane Bezerra DE MOURA (BRAZIL)
Chiramana SANDEEP (INDIA)	Lucianne Cople MAIA (BRAZIL)	Serhan AKMAN (TURKEY)
Christine Bettina STAUDT (SWITZERLAND)	Luciane Rezende COSTA (BRAZIL)	Sertac PEKER (TURKEY)
Cihan AKGUL (TURKEY)	Marri Sai ARCHANA (INDIA)	Seyed Amir Danesh SANI (USA)
Claudia DELLAVIA (ITALY)	Manoj KUMAR (INDIA)	Seyit Burhaneddin ZINCIRCIOLU (TURKEY)
Diah Ayu MAHARANI (INDONESIA)	Marcelo Rodrigues AZENHA (BRAZIL)	
Dinesh Rokaya (NEPAL)		Shailesh LELE (INDIA)
Edoardo BAUNER (ROMA)		
Emmanuel Joao N. Leal da SILVA (BRAZIL)		
Emin Caner TUMEN (TURKEY)		
Emrullah BAHSI (TURKEY)		

Ertunc Dayı (TURKEY)	Marcia Cancado FIGUEIREDO (BRAZIL)	Sinerik N. AYRAPETYAN (ARMENIA)
Fadel M. ALI (EGYPT)		Smaragda KAVADIA (GREECE)
Fahinur ERTUGRUL (TURKEY)	Marco MONTANARI (ITALY)	Sossani SIDIROPOULOU (GREECE)
Feral OZTURK (TURKEY)	Margaret TZAPHLIDOU (GREECE)	Stefano Di CARLO (ROME)
Feridun BASAK (TURKEY)	Maria Elisa Oliveira dos SANTOS (BRAZIL)	Sunit Kr. JUREL (INDIA)
Ferranti WONG (UNITED KINGDOM)		Stephen D. SMITH (USA)
Feyzi Çelik (TURKEY)	Medi GANIBEGOVIC (BOSNIA and HERZEGOVINA)	Susumu TEREKAWA (JAPAN)
Feyzullah Uçmak (TURKEY)	Mehmet DOGRU (TURKEY)	Suha TURKASLAN (TURKEY)
Figen SEYMEN (TURKEY)		Suleyman DASDAG (TURKEY)
Filippo BATTELLI (ITALY)	Mehmet Emin ERDAL (TURKEY)	Taskin GURBUZ (TURKEY)
Filiz Acun KAYA (TURKEY)	Mehmet Sinan DOGAN (TURKEY)	Ufuk ALUCLU (TURKEY)
Flavio Domingues Das NEVES (BRAZIL)		Ugur KEKLIKCI (TURKEY)
Folakemi OREDUGBA (NIGERIA)	Meral ERDİNC (TURKEY)	Xiong-Li YANG (CHINA)
Francesca De ANGELIS (ITALY)	Michele CALLEA (ITALY)	Vatan KAVAK (TURKEY)
Gaetano PAOLONE (ITALY)		Yasar YILDIRIM (TURKEY)
Gajanan Kiran KULKARNI (CANADA)	Mohamed TREBAK (USA)	Yasemin YAVUZ (TURKEY)
Gamze AREN (TURKEY)	Mohammad Khursheed Alam (KSA)	Yavuz SANISOGLU (TURKEY)
Gauri LELE (INDIA)	Mohammad SUHRON (INDONESIA)	Yu LEI (USA)
Gonul OLMEZ (TURKEY)	Mohammed Mustahsen URREHMAN (UAE)	Yuri LIMANSKI (UKRAINE)
Gulsen YILMAZ (TURKEY)		Zafer C. CEHRELI (TURKEY)
Gulten UNLU (TURKEY)	Moschos A. PAPADOPOULOS (GREECE)	Zeki AKKUS (TURKEY)
	Mostaphazadeh AMROLLAH (IRAN)	Zuhal KIRZIOGLU (TURKEY)
	M.S. Rami REDDY (INDIA)	Zurab KOMETIANI (GEORGIA)

Muhammad FAHIM
(INDIA)

Zurab S. KHABADZE
(RUSSIA)

Mukadder ATMACA
(TURKEY)

Murat AKKUS
(TURKEY)

Murat SOKER
(TURKEY)

Mustafa KELLE
(TURKEY)

Mustafa ZORTUK
(TURKEY)

Muzeyyen YILDIRIM
(TURKEY)

Neval Berrin ARSERIM
(TURKEY)

Editor of technical review: Zeynep YAVUZ / Editor of technical review:
Elifnur YAVUZ

[Design:TwTDizayn](#)

www.jidmr.com

www.journalofinternationaldentalandmedicalresearch.com



DENTISTRY

- EXPERIMENTAL ARTICLE
1. **Shear Bond Strength of Dentin Bonded to Various Restorative Materials Using Universal Resin Cements**
Rasita Kusolphat, Juthatip Aksornmuang, Boonlert Kukiattrakoon
Pages 1-10
- EXPERIMENTAL ARTICLE
2. **The Effect of Static Magnetic Field in Enhancing the Level of BMP-2 and FGF-2 during Early Phase of Osseointegration**
Leonard Christiaan Nelwan, Sindy Cornelia Nelwan, Asti Meizarini, Joyceline Eunika Jayakusuma, Nunthawan Nowwarote
Pages 11-14
- EXPERIMENTAL ARTICLE
3. **A Modified Experimental Model of Periodontitis in Rats: Morphological and Cytokine Profile**
Olga Neprelyuk, Sergey Neprelyuk, Alexander Vyselko, Anastasia Dzhelip, Irina Shemyakina, Svetlana Severinova, Maxim Kriventsov
Pages 15-21
- EXPERIMENTAL ARTICLE
4. **Clinical Evaluation of Platelet Rich Plasma Application on Autogenous Bone Graft in a Sheep Model**
Vera Julia, Lilies Dwi Sulistyani, Dwi Ariawan, Lully Kurniawan, Arbi Wijaya, Tri Isyani Tungga Dewi, Bambang Pontjo Priosoeryanto, Benny Sjariefsjah Latief
Pages 22-25
- EXPERIMENTAL ARTICLE
5. **The Fracture Resistance of Endodontically Treated Teeth with Biologic Posts of Different Lengths: in Vitro-Study**
Roshini Vijayakumaran Nair, Nancy Soliman Farghal, Riham Mohammed, Yellumbelase Gurananjappa Naveen
Pages 26-32
- EXPERIMENTAL ARTICLE
6. **Bracket Placement Accuracy with Indirect Bonding Method (An In-vitro Study)**
Ida Ayu Evangelina, Astri Nariswari, Endah Mardiaty, Elih Sayuti
Pages 33-37
- EXPERIMENTAL ARTICLE
7. **Comparison of Frictional Resistance of Micro-Crystalline and Polycrystalline Alumina Self-Ligating Ceramic Brackets with Stainless Steel Archwire**
Pichaporn Kanjanapapas, Panomwat Amornphimoltham, Bhudsadee Saenghirunvattana
Pages 38-43
- EXPERIMENTAL ARTICLE
8. **The Potential Application of Dental Pulp Stem Cells for Increasing Alveolar Bone Regeneration in Pre-Prosthetic Treatment**
Intan Ruspita, Mohammad Fadyl Yunizar, Pramudya Aditama, Murti Indrastuti, Sri Budi Barunawati, Suparyono Saleh, Dyah Listyarifah
Pages 44-50
- EXPERIMENTAL ARTICLE
9. **The Flexural Strength of Tricalcium silicate-White Portland Cement-Resin Versus Resin-Modified Calcium Silicate**
Ayu Trisna Hayati, Rizna Salsadila Shofwa, Indra Primathena, Arief Cahyanto, Denny Nurdin
Pages 51-57

TABLE OF CONTENTS / 2024; 17 (1)**EXPERIMENTAL ARTICLE**

- 10. Enhanced Osteoblasts and Collagen Production Using a Blood Cockle (*Anadara granosa*) and Lemuru Fish Oil (*Sardinella longiceps*) Granule Combination for Tooth Socket Healing**
Eddy Hermanto, Rima Parwati Sari, Vivin Ariestania, Monika Elida Sari, David Kamandjaja, Ida Bagus Narmada, Amelia Elizabeth Pranoto, Naufal Dhany Rizaki, Nurul Farida
Pages 58-63

EXPERIMENTAL ARTICLE

- 11. Influence of Surface Coatings on Color Stability and Surface Roughness of Provisional Prosthodontic Material**
Manitar Tangvipattanapong, Pranithida Kamonwanon, Rochaya Chintavalakorn, Toemsak Srihirin
Pages 64-70

EXPERIMENTAL ARTICLE

- 12. Potential of Stem Cells from Human Exfoliated Deciduous Teeth (SHED)-derived Secretome Gel in the Wound Healing Process Post Tooth Extraction**
Nikmatus Sa'adah, Rini Devijanti Ridwan, Indeswati Diyatri, Puspa Dila Rohmaniar, Agus Aan Adriansyah
Pages 71-76

EXPERIMENTAL ARTICLE

- 13. Assessment of Topographic Changes of Gutta-Percha Cones Treated with Three Different Reagents and a Final Rinse of Distilled Water- A Scanning Electron Microscope Study**
Srivastava Swati
Pages 77-81

EXPERIMENTAL ARTICLE

- 14. The Effects of the Freeze-Drying Method on the Characteristics of A B-Tricalcium Phosphate / Polyacrylic Acid Composite Block**
Rosalina Tjandrawinata, Eddy, Jackson Dipankara, Abida Zhafira Inayasary, Thet Thet Swe, Tansza Setiana Putri
Pages 82-84

EXPERIMENTAL ARTICLE

- 15. Microscopic Evaluation of The Mesial Root Canal Diameter, Wall Thickness and Root Concavity in Human Permanent Mandibular First Molars**
Phacharawalee Nanbunta, Peraya Puapichartdumrong, Weeraya Tantanapornkul, Kessiri Wisithphrom, Thosapol Piyapattamin
Pages 85-92

EXPERIMENTAL ARTICLE

- 16. A Biomechanical Finite Element Analysis of All-on-Four Concept using Short Implants in Maxilla**
Setyawan Bonifacius, Rasmi Rikmasari, Tatacipta Dirgantara, Cortino Sukotjo, Muhammad Yusril Sulaiman
Pages 93-98

EXPERIMENTAL ARTICLE

- 17. Accuracy Comparison of Different Chairside Retrofitting CAD/CAM Ceramic Inlays to An Existing Removable Partial Denture**
Yuwasiri Rewtrakul, Jadesada Palasuk, Kornchanok Wayakanon, Nawaporn Jittapiromsak
Pages 99-103

EXPERIMENTAL ARTICLE

- 18. Analysis of Characteristics of Cancellous Rib Freeze-Dried Bovine Bone as a Substitution Material**
Reza Al Fessi, Jan Victor Santoso, Shofi Shabrina Sugiarto, Coen Pramono Danudiningrat, Intan Nirwana, Asti Meizarini, Anita Yuliati
Pages 104-109

EXPERIMENTAL ARTICLE

- 19. An In-vitro Analysis of the Antimicrobial Efficacy of a Novel Obturating Material for Primary Teeth**
Lavanya Govindaraju, Ganesh Jeevanandan, Vishnu Priya Veeraraghavan, Mohamed El-Sherbiny, Ghala Basem Binshafi, Shouq Khalid alkharij, Elaf Abdulrahmam Alhazza, Rania A . Fouad, Ateya Megahed Ibrahim
Pages 110-114

EXPERIMENTAL ARTICLE

- 20. Effect of Chitosan Oligosaccharide Solution Against Candida Albicans and Color Stability of Heat-cured Polymethylmethacrylate**
Patcharawan Silthampitag, Tanyatorn Puangphimolkij, Pisaisit Chaijareenont, Phenphichar Wanachantararak
Pages 115-121

EXPERIMENTAL ARTICLE

- 21. Increased E-Cadherin Expression in Gingiva after Exposure Lipopolysaccharide Porphyromonas Gingivalis (LPS Pg) with Curcumin Application**
Novita Kusuma Wardhani, Eka Fitria Augustina
Pages 122-126

EXPERIMENTAL ARTICLE

- 22. Comparative Evaluation of Physical and Antimicrobial Properties of Metronidazole Incorporated Formulation of Mineral Trioxide Aggregate - An In-Vitro Study**
Vignesh Ravindran, Ganesh Jeevanandan, Vishnu Priya Veeraraghavan, Mohamed El-Sherbiny, Abdullah Loay Bohairi, Yaman MHD Rateb Mardini, Omar Saeed Badughaysh, Rania A. Found, Ateya Megahed Ibrahim
Pages 127-135

EXPERIMENTAL ARTICLE

- 23. Potential of Secretome – Hydrogel Based to Accelerate Bone Regeneration in Periodontitis: A Bioinformatics Approach**
Nenny Prasetyaningrum, Rini Devijanti Ridwan, Tania Saskianti, Dini Rachmawati, Mohammed Ahmed Aljunaid
Pages 136-144

EXPERIMENTAL ARTICLE

- 24. Retreatment Efficacy of XP-endo Shaper and Reciproc Blue in Removal of Bioceramic Sealers from Oval Shaped Canals- A Micro Computed Tomographic Study**
Srivastava Swati
Pages 145-150

EXPERIMENTAL ARTICLE

- 25. Negative Air Pressure Room Effect on Aerosol Distribution Patterns During Dental Procedures Using Ultrasonic Device**
Setyabudi, Ida Bagus Narmada, Dian Agustin Wahjuningrum, Ernie Maduratna Setyawati, Theresia Indah Budhy, Dini Setyowati, Tamara Yuanita, Niraj Kinariwala, Anuj Bhardwaj
Pages 151-155

EXPERIMENTAL ARTICLE

- 26. Effect of Spraying Time of Sodium Hypochlorite Solution on the Dimensional Stability of Alginate**
Aria Fransiska, Resty Pratama Nurliyani, Reni Nofika
Pages 156-160

EXPERIMENTAL ARTICLE

- 27. Healing Process of Bone Defects Based on the Location of Lesion with Osteogenesis Markers and Defect Size Measurement: A Preliminary Study**
Lusi Epsilawati, Azhari, Merry Annisa Damayanti, Aga Satria Nurrachman, Fadhil Ulum Abdul Rahman, Norlaila Sarifah, Putri Marina Sukmadewi, Mahindra Awwaludin Romdlon
Pages 161-167

TABLE OF CONTENTS / 2024; 17 (1)

- CLINICAL ARTICLE
- 28. Morphometric Features of Periodontal Phenotype and Anthropometric Parameters of the Maxillary Central Incisor in Patients with Generalized Periodontitis and Various Blood Types**
Bandrivsky Yurii, Bandrivska Orysia, Myroslav Goncharuk-Khomyn, Dutko Krystyna, Maika Iryna, Mits Iryna
Pages 168-175
- CLINICAL ARTICLE
- 29. Relationship Between Depression and Cognitive Function Disorders in Elderly Fishermen in Socah Bangkalan Village**
Sadya Wendra, Herin Setianingsih, Eva Pravitasari Nefertiti
Pages 176-180
- CLINICAL ARTICLE
- 30. Job Satisfaction among Registered Jordanian Dentists**
Reem Dababneh, Lina Obeidat, Yasin Al-tawarah
Pages 181-187
- CLINICAL ARTICLE
- 31. Sociodemographic Characteristics and Mapping of Patients with Cleft Lip and Palate**
Farisa Raunina Adinda, Fidya Meditia Putri, Asty Samiaty Setiawan
Pages 188-195
- CLINICAL ARTICLE
- 32. Association of Bone Loss Severity with Signs of Occlusal Trauma in Teeth with Reduced Periodontium**
Apichaya Pornprom, Jittima Pumklin, Sirilawan Tohnak, Thosapol Piyapattamin, Sodsi Wirojchanasak
Pages 196-202
- CLINICAL ARTICLE
- 33. Assessment of Attitudes and Practices Regarding Oral Healthcare Among the Parents During the War**
Kaskova Luidmyla F., Yanko Natalia V., Sadovski Marina O., Pavlenkova Oksana S., Vashchenko Irina Y., Novikova Svitlana C., Ulasevich Larisa P
Pages 203-208
- CLINICAL ARTICLE
- 34. Enhancing Denture Care Efficiency: Mobile Prosto Open-Source Software for Indonesian National Army Soldiers**
Nining Handayani, Arief Budiarto, Arif Rachman, Arlette Suzy Setiawan
Pages 209-214
- CLINICAL ARTICLE
- 35. Prevalence, Characteristics and Implications of Maxillary Sinus Septa: A Cross Sectional Study Using Cone Beam Computed Tomography (CBCT) in the Qassim Population**
Khalid Zabin Alotaibi
Pages 215-219
- CLINICAL ARTICLE
- 36. The Use of the Teledentistry Application Drgbeta.Com to Increase Access to Oral Health Services**
Manginar Sidabutar, Friska D. Simamora, Shri Ayu Purnami Mahastuti, Maria M. Laba
Pages 220-226
- CLINICAL ARTICLE
- 37. Salivary Leptin as a Potential Early Diagnostic Tumor Marker in Suspected Oral Cancer Patients**
Nur Armidha Nadiyah Amir Sabri, Basma Ezzat Mustafa, Khairani Idah Mokhtar, Mohammad Shafiq Mohd Ibrahim, Pram Kumar Subramaniam, Shamim Rahman
Pages 227-231

TABLE OF CONTENTS / 2024; 17 (1)

- CLINICAL ARTICLE
- 38. Bone Density and Microstructure of Osseointegration Dental Implants Treated with Gambir Extract Using Periapical Radiography**
Mochamad Yoga Dharmawan, Farina Pramanik, Azhari Azhari
Pages 232-238
- CLINICAL ARTICLE
- 39. Electromyographic Potential of Mastication Muscles of Patients with Hearing Deprivation and Dental Anomalies**
Sokolowska-Nykina Yu.K., Kuroiedova V.D., Stasiuk O.A., Korobov P.S.
Pages 239-246
- CLINICAL ARTICLE
- 40. Relationship Head Posture in Class II Skeletal Malocclusion Against Canal Width Breath and Hyoid Bone Position**
Frisca Rhiyanthy, Mimi Marina Lubis, Muslim Yusuf, Ervina Sofiyanti, Siti Bahirrah
Pages 247-252
- CLINICAL ARTICLE
- 41. Knowledge and Practices of Orthodontists, Pediatric Dentists and General Dentists on Treatment of Crowding in Mixed Dentition**
Mariano Ortiz-Pizarro, Sheyla Julca-Maldonado, Darwin Ayala- Céspedes, Nicolle Bonilla-Feria, Christian Dávila-Carbajal, Víctor Serna-Alarcón
Pages 253-259
- CLINICAL ARTICLE
- 42. The Influence of Self-Efficacy and Social Support on Capability (C), Opportunity (O) and Motivation (M) (Com B) in Adolescents' Adoption of Sexual Abstinence in Surabaya**
Pulung Siswantara, Mochammad Bagus Qomaruddin
Pages 260-267
- CLINICAL ARTICLE
- 43. Impact of Digital Dentistry Technologies on the Educational Motivation of Dental Students Experiencing Stress on the Background of Ongoing War in Ukraine**
Myroslav Goncharuk-Khomyn, Iurii Mochalov, Anatolii Bokoch, Yuriy Rak, Marjan Domysche, Yuriy Melnyk, Ivan Bohdan
Pages 268-276
- CLINICAL ARTICLE
- 44. Effect of Consuming Rebon Shrimp Crackers on Saliva Characteristics in Percobaan Public Elementary School Medan**
Gema Nazri Yanti, Darmayanti Siregar, Siska Ella Natassa, Ranu Putra Armidin
Pages 277-282
- CLINICAL ARTICLE
- 45. Effect of Mandibular Inclination on CBCT Artifact Presented in Endodontically-Treated Teeth**
Kanokwan Wiwatcharoen, Sirilawan Tohnak, Chutamas Deepho, Adjabhak Wongviriyaya, Kittipong Ketpan, Peraya Puapichartdumrong, Khemjira Jarassri, Kasidid Ruksakiet, Kessiri Wisithphrom
Pages 283-290
- CLINICAL ARTICLE
- 46. Nose Shape of Indonesians: A Photogrammetric Analysis of Javanese and Minangkabau Children**
Sri Kuswandari, Alfiah Pujiyati
Pages 291-297
- CLINICAL ARTICLE
- 47. Evaluation of Root Canal Treatment Anxiety Among Jordanian Patients**
Jamal Aqrabawi, Maher Jarbawi
Pages 298-303

CLINICAL ARTICLE

- 48. Effectiveness of Fones Technique Education Using Audiovisual Media of Students' Knowledge**
Reno Wiska Wulandari, Rahmi Khairani Aulia, Nila Kasuma, Haria Fitri, Riska Ananda Pratiwi, Thifla Rafifa Wirza
Pages 304-309

CLINICAL ARTICLE

- 49. Evaluating Root Canal Treatment Quality by Undergraduate Dental Students at Gulf Medical University**
Khawlah Rashed Ahmed Al-Dhanhani, Ranya Faraj Elemam, Tarek Elsewify, Dusan Surdilovic, Bassem Mohamed Mahmoud Eid
Pages 310-318

CLINICAL ARTICLE

- 50. Development of an Instrument Model for Implementing Family Oral Health Care Services with a Holistic Approach**
Reca Reca, Hizir Sofyan, Poppy Andriany, Marthoenis Marthoenis
Pages 319-327

CLINICAL ARTICLE

- 51. Serum and Salivary Levels of CXCL16 In Health and Periodontitis: A Comparative Preliminary Investigation**
Anirudh B. Acharya, Sagar Jagadeesh, Sunaina Shetty, Swetha Acharya, Srinath Thakur, Betul Rahman
Pages 328-334

CLINICAL ARTICLE

- 52. Pain Management during Orthodontic Treatment in Western Indonesia: A Cross-Sectional Study**
Dhea Putri Febriannavisha, Avi Laviana, Gita Gayatri
Pages 335-345

CLINICAL ARTICLE

- 53. Relationship of Periodontal Disease and Electronic Cigarette Usage among Adolescents in Jazan Population, KSA**
Wael Ibraheem, Ahmed M. Bokhari, Mohammad Nazish Alam, Hussain Ahmed Munthiri, Hussam Abdullah Arishi, Abdulrahman Khalid Alsabei
Pages 346-351

CLINICAL ARTICLE

- 54. Treatment Needs of Thai Dental Patients Aged 55 Years and Older**
Pissacha Daroonpan, Ruchadaporn Kaomongkolgit, Weeraya Tantanapornkul, Sirilawan Tohnak, Ichaya Yiamwattana, Ronnayut Chansamat
Pages 352-356

CLINICAL ARTICLE

- 55. Treatment of Dentognathic Anomalies and Deformations in Children with Congenital Unilateral Cleft Lip and Palate**
Valerii V. Filonenko, Oleksandr A. Kaniura, Vadim A. Sokolovskiy
Pages 357-362

CLINICAL ARTICLE

- 56. Awareness and Knowledge of Digital Dentistry amongst Undergraduate Dental Students at an Academic Institution in the UAE: A Cross Sectional Study**
Nouran Hamed, Samantha Aronda, Maryam Sami, Pooja Adtani
Pages 363-369

CASE REPORT

- 57. Pharmacological Treatment of Medication-Related Osteonecrosis of the Jaw (MRONJ) with Pentoxifylline and Tocopherol – Report of Two Cases**
Lukasz Slowik, Ewa Toton, Aleksy Nowak, Aleksandra Wysocka-Slowik, Krzysztof Osmola, Zuzanna Slebioda
Pages 370-376

CASE REPORT

- 58. Dental Management Consideration of Severe Early Childhood Caries in Down Syndrome with Autistic Features: A Case Report**

Amrita Widyagarini, Keren Esterlita Nasution, Labiba Idzni Marjani, Margaretha Suharsini
Pages 377-381

CASE REPORT

- 59. Volumetric Reconstruction of the Alveolar Ridge after Marginal Resection of the Anterior Part of the Lower Jaw. Clinical Case**

S.Yu. Ivanov, A.A. Muraev, S.G. Ivashkevich, R.F. Mukhametshin, H.M. Nalchajyan
Pages 382-386

CASE REPORT

- 60. Lower Lip Schwannoma in Pediatric Patient- A Rare Case Report with Review of Literature**

Mohammed M. Bakri
Pages 387-391

CASE REPORT

- 61. Hall Technique Crown for Amelogenesis Imperfecta in Primary Molars: A Case Report**

Udijanto Tedjosongko, Rosiana Dewi Prayogo, Sindy Cornelia Nelwan, Ardianti Maartrina Dewi, Carmine Scelza, Michele Callea, Nora Kharisma Rissandhika, Dimas Surya Saputra, Dimas Prasetianto Wicaksono
Pages 392-395

CASE REPORT

- 62. Root canal treatment of Maxillary First Premolar with Three Roots: A case report**

Mahir Mirah
Pages 396-399

REVIEW

- 63. Oral Health Reflects the General Health of Elderly**

Zahreni Hamzah, Dyah Indartin Setyowati, Tecky Indriana, Suhartini
Pages 400-406

REVIEW

- 64. Anterior Teeth Esthetics in Prosthodontics and Restorative Dentistry**

Chu Thi Quynh Huong, Trinh Hai Anh, Trinh Dinh Hai
Pages 407-413

REVIEW

- 65. The Effectiveness of Oral Propolis on Mucosa Wound Healing after Removal Third Molars Surgery: A Systematic Review**

Yudy Ardilla Utomo, Mohammad Adhitya Latief, Iin Sandya Amalia
Pages 414-419

REVIEW

- 66. Modern View of the Influence of Removable Dentures on the Oral Cavity Tissues and the Organism (Review)**

Poliukhovych Yulia, Patskan Liudmyla, Pohoretska Khrystyna, Demkovych Andrii, Stoikevych Halyna, Machogan Volodymyr, Bondarenko Yurii
Pages 420-428

REVIEW

- 67. Effect of Diabetes Mellitus on Each Phase of Tooth Extraction Socket Healing**

Puspa Dila Rohmaniar, Retno Pudji Rahayu, IDA Bagus Narmada, Nikmatius Sa'adah, Dwi Andriani
Pages 429-434

REVIEW

68. Treatment Outcome Comparison between Tooth Borne vs Bone Borne Intermaxillary Fixation Devices: A Systematic Review

Lilies Dwi Sulistyani, Vera Julia, Dwi Ariawan, Mohammad Adhitya Latief, Yudy Ardilla Utomo, Maudina Dwi Heriasti, Sherly Santiago, Dessy Dwi Utami, Iwan Ristiawan
Pages 435-444

REVIEW

69. Aerosols in Dentistry: A Review

Setyabudi, Dian Agustin Wahjuningrum, Ida Bagus Narmada, Ernie Maduratna Setyawati, Theresia Indah Budhy, Dini Setyawati, Tamara Yuanita, Ajinkya M. Pawar, Niraj Kinariwala
Pages 445-452

REVIEW

70. Correlation between Salivary pH in Menopausal Women and Oral Lactobacillus: A Rapid Review

Qonita Faizulhyrza Tabayyana, Hening Tjaturina Pramesti, Sri Tjahajawati
Pages 453-461

The Effects of the Freeze-Drying Method on the Characteristics of A B-Tricalcium Phosphate / Polyacrylic Acid Composite Block

Rosalina Tjandrawinata¹, Eddy¹, Jackson Dipankara², Abida Zhafira Inayasary¹,
Thet Thet Swe³, Tansza Setiana Putri^{1*}

1. Department of Dental Materials, Faculty of Dentistry, Universitas Trisakti, Jl. Kyai Tapa 260, Jakarta, 11440, Indonesia.
2. Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Universitas Trisakti, Jl. Kyai Tapa 260, Jakarta, 11440, Indonesia.
3. Department of Physics, University of Yangon, Kamayut, Yangon, 11041, Myanmar.

Abstract

A mixture of β -tricalcium phosphate (β TCP) made from green mussel shells and polyacrylic acid (PAA) solution was successfully prepared via a setting reaction and reinforced by a freeze-drying process. The freeze-drying process is a popular method for producing bone substitute materials with porous structures. The sublimation process in freeze-drying eliminates the remaining water or solvent leaving the pores in the materials. The purpose of this study is to evaluate the effect of the freeze-drying method on the porosity and mechanical strength of a β TCP/PAA composite block. Initially, a mixture of β TCP powder with PAA solution was put inside a mold, frozen at low temperature, and dried to obtain a composite block. As a control, the same mixture was stored at 37 °C in an incubator without the freeze-drying process.

Porosity and diametral tensile strength (DTS) were investigated and compared with the control samples obtained without the freeze-drying process. Freeze-dried samples had lower porosity ($26.97 \pm 2.64\%$) and higher DTS (11.76 ± 1.59 MPa) than the control sample (porosity: $37.47 \pm 4.49\%$; DTS: 6.19 ± 1.85 MPa).

In conclusion, the freeze-drying process decreased the porosity of the β TCP/PAA composite block and increased the mechanical strength in terms of DTS value.

Experimental article (J Int Dent Med Res 2024; 17(1): 82-84)

Keywords: Freeze-Drying, B-Tricalcium Phosphate, Polyacrylic Acid, Diametral Tensile Strength, Porosity.

Received date: 08 December 2023

Accept date: 04 January 2024

Introduction

The fabrication of a composite material comprising calcium phosphate and a polymer mixture through freeze-drying is an innovative method for creating artificial bone substitutes. This method aims to create a scaffold with enhanced mechanical strength, biocompatibility, and bioactivity that is suitable for bone tissue regeneration. Several studies have reported the successful fabrication of calcium phosphate materials, such as hydroxyapatite and β -tricalcium phosphate (β TCP; $\text{Ca}_3(\text{PO}_4)_2$) mixed with various kinds of polymer using the freeze-drying method.¹⁻³ However, most of these experiments used chemically synthetic reagents

as the precursor, which are costly and limited in availability, especially in developing countries.

Pu'ad et al. stated that natural sources can be useful in the fabrication of calcium phosphate materials, such as hydroxyapatite and tricalcium phosphate.⁴ One of the natural sources commonly used in the production of calcium phosphate materials is shellfish. In Indonesia, the green mussel is one of the most frequently consumed shellfish, resulting in a substantial amount of green mussel shell waste.⁴⁻⁶ The calcium carbonate (CaCO_3) content in the shells is beneficial in the synthesis of calcium phosphate, particularly β TCP. Compared to hydroxyapatite, β TCP is more bioresorbable, allowing the gradual replacement of β TCP with new bone tissue, which eventually facilitates bone remodelling.⁷⁻⁹ This study employed green mussel shells in the synthesis of β TCP as the inorganic component.

The fabrication of pure β TCP blocks through a setting reaction between β TCP and polyacrylic acid (PAA: $(\text{C}_3\text{H}_4\text{O}_2)_n$) followed by a

*Corresponding author:

Tansza Setiana Putri,
Department of Dental Materials, Faculty of Dentistry,
Universitas Trisakti, Campus B, Jl. Kyai Tapa 260, Grogol,
Jakarta 11440, Indonesia.
E-mail: tansza@trisakti.ac.id

sintering process has been reported by Putri et al.¹⁰ The current study adopts the binding mechanism between β TCP and PAA in which the carboxyl group ($-\text{COOH}$) in PAA bonds with calcium ions in β TCP to produce a composite block. However, in this method, water could possibly remain inside the block. Thus, a freeze-drying process was employed to eliminate the remaining water.

Therefore, the purpose of this study is to evaluate the diametral tensile strength (DTS) of a β TCP/PAA composite block obtained through the freeze-drying method.

Materials and methods

Preparation of β TCP powder was initiated by heating green mussel shells at 110 °C for 5 h and crushing them into powder. The powder was then sintered at 1,000 °C to convert it to calcium oxide. The powder was then reacted with a phosphoric acid solution with a calcium phosphate (Ca/P) ratio of 1.5 to obtain β TCP.

The β TCP powder was hand-mixed with a PAA solution (Mw: ~250,000, 35 wt% in H_2O , Sigma Aldrich, USA) on a paper pad with a spatula to produce a viscous paste, which was then put inside a mold with a diameter and thickness of 6 mm and 3 mm, respectively. The weight ratio of β TCP to PAA was 70 to 30. The mixture was deep-frozen at -80 °C to convert the remaining water into the ice crystal phase, followed by freeze-drying for the lyophilization process for 48 h. As a control, the mixture was only kept at 37 °C for 24 h in an incubator without the freeze-drying process to set.

The composite block was measured for porosity by subtracting the density from 100%, where density was calculated from the sample's weight and volume (Eqs. 1 and 2).^{11,12}

$$(1) \text{ Relative density (\%)} = \frac{\text{bulk density}}{\text{theoretical density}} \times 100 (\%)$$

$$(2) \text{ Total porosity (\%)} = 100 - \text{relative density (\%)}$$

The DTS value was evaluated using a universal testing machine (UTM: AGS-X, Shimadzu, Japan) with a crosshead speed of 1 mm/min.

Statistical analysis was performed with KaleidaGraph 4.01 software (Synergy Software) using one-way analysis of variance (ANOVA) and Fisher's least significant difference (LSD) post-

hoc analysis to evaluate significant differences with a significance level set to $p < 0.05$.

Results

The appearance of the composite block is shown in Figure 1. The mixture of β TCP with PAA was successfully set into blocks. There were slight visible differences between the samples: the composite block synthesized without the freeze-drying process (Sample A) seemed to expand at the top compared to the block synthesized with the freeze-drying process (Sample B). This was confirmed by calculating the block volume, with Sample A having a higher volume ($0.11 \pm 0.01 \text{ cm}^3$) compared to Sample B ($0.08 \pm 0.01 \text{ cm}^3$).

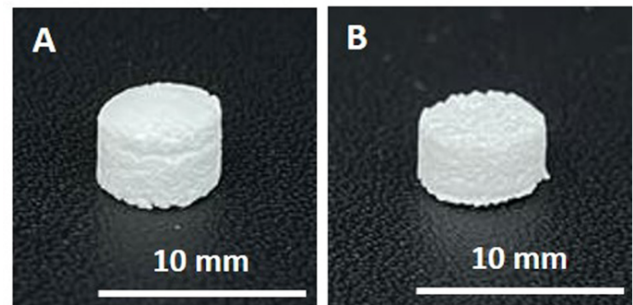


Figure 1. Photograph image of composite blocks containing β TCP mixed with PAA through (A) incubation and (B) freeze-drying method.

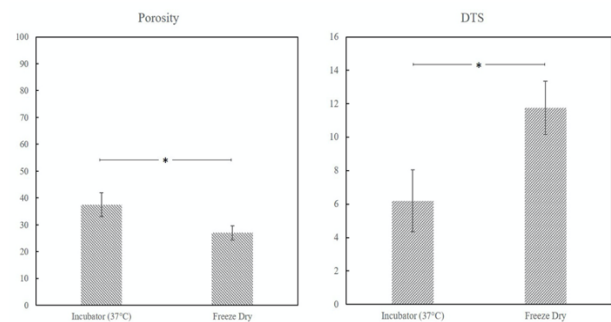


Figure 2. Porosity and DTS values of composite blocks containing β TCP mixed with PAA through incubation and freeze-drying method ($n = 3$).

The porosity and DTS values of the samples are displayed in Figure 2. The composite block fabricated through freeze-drying had significantly lower porosity ($26.97 \pm 2.64\%$) and higher DTS ($11.76 \pm 1.59 \text{ MPa}$) compared to the control block (porosity: $37.47 \pm 4.49\%$; DTS: $6.19 \pm 1.85 \text{ MPa}$).

Discussion

The composite block prepared through the freeze-drying method has a lower volume than the one set only by incubation at 37°C. This was due to the elimination of remaining water inside the block, which resulted in shrinkage. The freeze-drying process began with a freezing stage at a low temperature in which the remaining solvent or water turned into ice crystals. Upon drying, a sublimation process took place, leading to a decrease in the sample's volume. This was confirmed by a previous study by Moradi et al.¹³ Haugh et al¹⁴ also investigated the decrease in pore size of a scaffold due to the freeze-drying process. This study has proven that freeze-drying decreases a sample's volume, as well as its porosity.

Porous structures in bone substitute materials are crucial in facilitating the penetration of bone cells and tissue into the materials and promote new bone formation. Additionally, porosity influences the mechanical strength of a material. This coincides with the findings of this research, which indicate that lower porosity in the samples resulted in increased values of DTS.

The bonding mechanism between β TCP and PAA also plays a role in increasing mechanical strength. Carboxyl groups ($-\text{COOH}$) contained in PAA bind with calcium ions (Ca^{2+}) in the β TCP through chelating reactions, leading to the setting of the mixture. The bonding between these two reinforces the structure, which contributes to improved mechanical strength.^{10,15} In the current study, both samples went through the bonding reaction. However, the freeze-dried samples were reinforced by decreased porosity, which means higher density and higher mechanical strength.

Conclusions

A composite block fabricated from β TCP and PAA through a freeze-drying method was found to have lower porosity and higher mechanical strength compared to a composite block synthesized without a freeze-drying process. However, the findings in this study need further characterization, such as FTIR observation, to confirm the bonding between the two materials. Other weight ratios of β TCP and PAA also need to be investigated.

Acknowledgements

The authors would like to thank Universitas Trisakti for supporting this research (reference number: 0604/PUF/FGK/2023-2024).

Declaration of Interest

The authors report no conflict of interest.

References

1. Maji K, Dasgupta S, Pramanik K, Bissoyi A. Preparation and characterization of gelatin-chitosan-nano β -TCP based scaffold for orthopaedic application. *Mater Sci Eng C*. 2018;86(November 2017):83-94. doi:10.1016/j.msec.2018.02.001
2. Serra IR, Fradique R, Vallejo MCS, Correia TR, Miguel SP, Correia IJ. Production and characterization of chitosan/gelatin/ β -TCP scaffolds for improved bone tissue regeneration. *Mater Sci Eng C*. 2015;55:592-604. doi:10.1016/j.msec.2015.05.072
3. Putri TS, Ratnasari A, Sofiyanningsih N, Nizar MS, Yuliati A, Shariff KA. Mechanical improvement of chitosan-gelatin scaffolds reinforced by β -tricalcium phosphate bioceramic. *Ceram Int*. 2022;48(8):11428-11434. doi:10.1016/j.ceramint.2021.12.367
4. Mohd Pu'ad NAS, Koshy P, Abdullah HZ, Idris MI, Lee TC. Syntheses of hydroxyapatite from natural sources. *Heliyon*. 2019;5(5):e01588. doi:10.1016/j.heliyon.2019.e01588
5. Kang K-R, Piao Z-G, Kim J-S, et al. Synthesis and Characterization of β -Tricalcium Phosphate Derived from *Haliotis* sp. Shells. *Implant Dent*. 2017;26(3):378-387. doi:10.1097/ID.0000000000000559
6. Wahyudi B, Muljani S, Alfian MA, Zukhrufiansyah AR. Synthesis and Characteristics of β -Tri-Calcium Phosphate from Green Mussel Shell. *J Phys Conf Ser*. 2020;1569(4):42056. doi:10.1088/1742-6596/1569/4/042056
7. Bohner M, Santoni BLG, Döbelin N. β -tricalcium phosphate for bone substitution: Synthesis and properties. *Acta Biomater*. 2020;113:23-41. doi:10.1016/j.actbio.2020.06.022
8. Santoso HA, Eddy. Potensi penggunaan β -tricalcium phosphate sebagai bahan substansi tulang. *J Kedokt Gigi Terpadu*. 2023;5(1):54-57.
9. Bellucci D, Sola A, Cannillo V. Hydroxyapatite and tricalcium phosphate composites with bioactive glass as second phase: State of the art and current applications. *J Biomed Mater Res - Part A*. 2016;104(4):1030-1056. doi:10.1002/jbm.a.35619
10. Putri TS, Sugiura Y, Tsuru K, Ishikawa K. Fabrication of an interconnected porous β -tricalcium phosphate structure by polyacrylic acid-mediated setting reaction and sintering. *J Ceram Soc Japan*. 2020;128(8):555-559. doi:10.2109/jcersj.2.20059
11. Putri TS, Rianti D, Rachmadi P, Yuliati A. Effect of glutaraldehyde on the characteristics of chitosan-gelatin- β -tricalcium phosphate composite scaffolds. *Mater Lett*. 2021;304:130672. doi:10.1016/j.matlet.2021.130672
12. Putri TS, Elsheikh M. Flexural Strength Evaluation of Chitosan-Gelatin-B-Tricalcium Phosphate-Based Composite Scaffold. *J Int Dent Med Res*. 2022;15(1):31-34.
13. Moradi A, Pramanik S, Ataollahi F, Abdul Khalil A, Kamarul T, Pinguan-Murphy B. A comparison study of different physical treatments on cartilage matrix derived porous scaffolds for tissue engineering applications. *Sci Technol Adv Mater*. 2014;15(6):065001. doi:10.1088/1468-6996/15/6/065001
14. Haugh MG, Murphy CM, O'Brien FJ. Novel freeze-drying methods to produce a range of collagen-glycosaminoglycan scaffolds with tailored mean pore sizes. *Tissue Eng - Part C Methods*. 2010;16(5):887-894. doi:10.1089/ten.tec.2009.0422
15. Xiong L, Yang T, Yang Y, Xu C, Li F. Long-term in vivo biodistribution imaging and toxicity of polyacrylic acid-coated upconversion nanophosphors. *Biomaterials*. 2010;31(27):7078-7085. doi:https://doi.org/10.1016/j.biomaterials.2010.05.065.

The Effects of the Freeze-Drying Method on the Characteristics of A B-Tricalcium Phosphate / Polyacrylic Acid Composite Block

by Rosalina Tjandrawinata FKG

Submission date: 04-Apr-2024 12:19PM (UTC+0700)

Submission ID: 2266291516

File name: 14-D23_2958_Tansza_Permata_Setiana_Putri_Indonesia-Exp.pdf (517.65K)

Word count: 2090

Character count: 11359

The Effects of the Freeze-Drying Method on the Characteristics of A B-Tricalcium Phosphate / Polyacrylic Acid Composite Block

Rosalina Tjandrawinata¹, Eddy¹, Jackson Dipankara², Abida Zhafira Inayasary¹,
Thet Thet Swe³, Tansza Setiana Putri^{1*}

1. Department of Dental Materials, Faculty of Dentistry, Universitas Trisakti, Jl. Kyai Tapa 260, Jakarta, 11440, Indonesia.

2. Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Universitas Trisakti, Jl. Kyai Tapa 260, Jakarta, 11440, Indonesia.

3. Department of Physics, University of Yangon, Kamayut, Yangon, 11041, Myanmar.

Abstract

A mixture of β -tricalcium phosphate (β TCP) made from green mussel shells and polyacrylic acid (PAA) solution was successfully prepared via a setting reaction and reinforced by a freeze-drying process. The freeze-drying process is a popular method for producing bone substitute materials with porous structures. The sublimation process in freeze-drying eliminates the remaining water or solvent leaving the pores in the materials. The purpose of this study is to evaluate the effect of the freeze-drying method on the porosity and mechanical strength of a β TCP/PAA composite block. Initially, a mixture of β TCP powder with PAA solution was put inside a mold, frozen at low temperature, and dried to obtain a composite block. As a control, the same mixture was stored at 37 °C in an incubator without the freeze-drying process.

Porosity and diametral tensile strength (DTS) were investigated and compared with the control samples obtained without the freeze-drying process. Freeze-dried samples had lower porosity ($26.97 \pm 2.64\%$) and higher DTS (11.76 ± 1.59 MPa) than the control sample (porosity: $37.47 \pm 4.49\%$; DTS: 6.19 ± 1.85 MPa).

In conclusion, the freeze-drying process decreased the porosity of the β TCP/PAA composite block and increased the mechanical strength in terms of DTS value.

Experimental article (J Int Dent Med Res 2024; 17(1): 82-84)

Keywords: Freeze-Drying, B-Tricalcium Phosphate, Polyacrylic Acid, Diametral Tensile Strength, Porosity.

Received date: 08 December 2023

Accept date: 04 January 2024

Introduction

The fabrication of a composite material comprising calcium phosphate and a polymer mixture through freeze-drying is an innovative method for creating artificial bone substitutes. This method aims to create a scaffold with enhanced mechanical strength, biocompatibility, and bioactivity that is suitable for bone tissue regeneration. Several studies have reported the successful fabrication of calcium phosphate materials, such as hydroxyapatite and β -tricalcium phosphate (β TCP; $\text{Ca}_3(\text{PO}_4)_2$) mixed with various kinds of polymer using the freeze-drying method.¹⁻³ However, most of these experiments used chemically synthetic reagents

as the precursor, which are costly and limited in availability, especially in developing countries.

Pu'ad et al. stated that natural sources can be useful in the fabrication of calcium phosphate materials, such as hydroxyapatite and tricalcium phosphate.⁴ One of the natural sources commonly used in the production of calcium phosphate materials is shellfish. In Indonesia, the green mussel is one of the most frequently consumed shellfish, resulting in a substantial amount of green mussel shell waste.⁴⁻⁶ The calcium carbonate (CaCO_3) content in the shells is beneficial in the synthesis of calcium phosphate, particularly β TCP. Compared to hydroxyapatite, β TCP is more bioresorbable, allowing the gradual replacement of β TCP with new bone tissue, which eventually facilitates bone remodelling.⁷⁻⁹ This study employed green mussel shells in the synthesis of β TCP as the inorganic component.

The fabrication of pure β TCP blocks through a setting reaction between β TCP and polyacrylic acid (PAA: $(\text{C}_3\text{H}_4\text{O}_2)_n$) followed by a

*Corresponding author:

Tansza Setiana Putri,
Department of Dental Materials, Faculty of Dentistry,
Universitas Trisakti, Campus B, Jl. Kyai Tapa 260, Grogol,
Jakarta 11440, Indonesia.
E-mail: tansza@trisakti.ac.id

sintering process has been reported by Putri et al.¹⁰ The current study adopts the binding mechanism between β TCP and PAA in which the carboxyl group ($-\text{COOH}$) in PAA bonds with calcium ions in β TCP to produce a composite block. However, in this method, water could possibly remain inside the block. Thus, a freeze-drying process was employed to eliminate the remaining water.

Therefore, the purpose of this study is to evaluate the diametral tensile strength (DTS) of a β TCP/PAA composite block obtained through the freeze-drying method.

Materials and methods

Preparation of β TCP powder was initiated by heating green mussel shells at 110 °C for 5 h and crushing them into powder. The powder was then sintered at 1,000 °C to convert it to calcium oxide. The powder was then reacted with a phosphoric acid solution with a calcium phosphate (Ca/P) ratio of 1.5 to obtain β TCP.

The β TCP powder was hand-mixed with a PAA solution (Mw: ~250,000, 35 wt% in H_2O , Sigma Aldrich, USA) on a paper pad with a spatula to produce a viscous paste, which was then put inside a mold with a diameter and thickness of 6 mm and 3 mm, respectively. The weight ratio of β TCP to PAA was 70 to 30. The mixture was deep-frozen at -80 °C to convert the remaining water into the ice crystal phase, followed by freeze-drying for the lyophilization process for 48 h. As a control, the mixture was only kept at 37 °C for 24 h in an incubator without the freeze-drying process to set.

The composite block was measured for porosity by subtracting the density from 100%, where density was calculated from the sample's weight and volume (Eqs. 1 and 2).^{11,12}

$$(1) \text{ Relative density (\%)} = \frac{\text{bulk density}}{\text{theoretical density}} \times 100 (\%)$$

$$(2) \text{ Total porosity (\%)} = 100 - \text{relative density (\%)}$$

The DTS value was evaluated using a universal testing machine (UTM: AGS-X, Shimadzu, Japan) with a crosshead speed of 1 mm/min.

Statistical analysis was performed with KaleidaGraph 4.01 software (Synergy Software) using one-way analysis of variance (ANOVA) and Fisher's least significant difference (LSD) post-

hoc analysis to evaluate significant differences with a significance level set to $p < 0.05$.

Results

The appearance of the composite block is shown in Figure 1. The mixture of β TCP with PAA was successfully set into blocks. There were slight visible differences between the samples: the composite block synthesized without the freeze-drying process (Sample A) seemed to expand at the top compared to the block synthesized with the freeze-drying process (Sample B). This was confirmed by calculating the block volume, with Sample A having a higher volume ($0.11 \pm 0.01 \text{ cm}^3$) compared to Sample B ($0.08 \pm 0.01 \text{ cm}^3$).

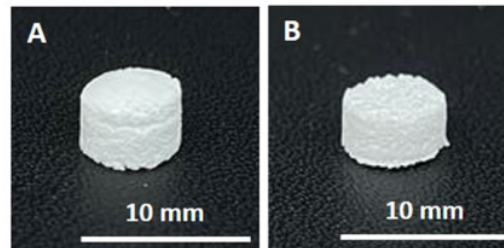


Figure 1. Photograph image of composite blocks containing β TCP mixed with PAA through (A) incubation and (B) freeze-drying method.

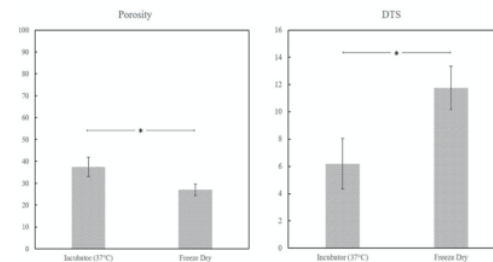


Figure 2. Porosity and DTS values of composite blocks containing β TCP mixed with PAA through incubation and freeze-drying method ($n = 3$).

The porosity and DTS values of the samples are displayed in Figure 2. The composite block fabricated through freeze-drying had significantly lower porosity ($26.97 \pm 2.64\%$) and higher DTS ($11.76 \pm 1.59 \text{ MPa}$) compared to the control block (porosity: $37.47 \pm 4.49\%$; DTS: $6.19 \pm 1.85 \text{ MPa}$).

Discussion

The composite block prepared through the freeze-drying method has a lower volume than the one set only by incubation at 37°C. This was due to the elimination of remaining water inside the block, which resulted in shrinkage. The freeze-drying process began with a freezing stage at a low temperature in which the remaining solvent or water turned into ice crystals. Upon drying, a sublimation process took place, leading to a decrease in the sample's volume. This was confirmed by a previous study by Moradi et al.¹³ Haugh et al¹⁴ also investigated the decrease in pore size of a scaffold due to the freeze-drying process. This study has proven that freeze-drying decreases a sample's volume, as well as its porosity.

Porous structures in bone substitute materials are crucial in facilitating the penetration of bone cells and tissue into the materials and promote new bone formation. Additionally, porosity influences the mechanical strength of a material. This coincides with the findings of this research, which indicate that lower porosity in the samples resulted in increased values of DTS.

The bonding mechanism between β TCP and PAA also plays a role in increasing mechanical strength. Carboxyl groups ($-\text{COOH}$) contained in PAA bind with calcium ions (Ca^{2+}) in the β TCP through chelating reactions, leading to the setting of the mixture. The bonding between these two reinforces the structure, which contributes to improved mechanical strength.^{10,15} In the current study, both samples went through the bonding reaction. However, the freeze-dried samples were reinforced by decreased porosity, which means higher density and higher mechanical strength.

Conclusions

A composite block fabricated from β TCP and PAA through a freeze-drying method was found to have lower porosity and higher mechanical strength compared to a composite block synthesized without a freeze-drying process. However, the findings in this study need further characterization, such as FTIR observation, to confirm the bonding between the two materials. Other weight ratios of β TCP and PAA also need to be investigated.

Acknowledgements

The authors would like to thank Universitas Trisakti for supporting this research (reference number: 0604/PUF/FKG/2023-2024).

Declaration of Interest

The authors report no conflict of interest.

References

1. Maji K, Dasgupta S, Pramanik K, Bissoyi A. Preparation and characterization of gelatin-chitosan-nano β -TCP based scaffold for orthopaedic application. *Mater Sci Eng C*. 2018;86(November 2017):83-94. doi:10.1016/j.msec.2018.02.001
2. Serra IR, Fradique R, Vallejo MCS, Correia TR, Miguel SP, Correia IJ. Production and characterization of chitosan/gelatin/ β -TCP scaffolds for improved bone tissue regeneration. *Mater Sci Eng C*. 2015;55:592-604. doi:10.1016/j.msec.2015.05.072
3. Putri TS, Ratnasari A, Sofiyarningsih N, Nizar MS, Yuliaty A, Shariff KA. Mechanical improvement of chitosan-gelatin scaffolds reinforced by β -tricalcium phosphate bioceramic. *Ceram Int*. 2022;48(8):11428-11434. doi:10.1016/j.ceramint.2021.12.367
4. Mohd Pu'ad NAS, Koshy P, Abdullah HZ, Idris MI, Lee TC. Syntheses of hydroxyapatite from natural sources. *Heliyon*. 2019;5(5):e01588. doi:10.1016/j.heliyon.2019.e01588
5. Kang K-R, Piao Z-G, Kim J-S, et al. Synthesis and Characterization of β -Tricalcium Phosphate Derived from *Halotis* sp. Shells. *Implant Dent*. 2017;26(3):378-387. doi:10.1097/ID.0000000000000559
6. Wahyudi B, Muljani S, Alfian MA, Zukhrufiansyah AR. Synthesis and Characteristics of β -Tri-Calcium Phosphate from Green Mussel Shell. *J Phys Conf Ser*. 2020;1569(4):42056. doi:10.1088/1742-6596/1569/4/042056
7. Bohner M, Santoni BLG, Döbelin N. β -tricalcium phosphate for bone substitution: Synthesis and properties. *Acta Biomater*. 2020;113:23-41. doi:10.1016/j.actbio.2020.06.022
8. Santoso HA, Eddy. Potensi penggunaan β -tricalcium phosphate sebagai bahan substansi tulang. *J Kedokt Gigi Terpadu*. 2023;5(1):54-57.
9. Bellucci D, Sola A, Cannillo V. Hydroxyapatite and tricalcium phosphate composites with bioactive glass as second phase: State of the art and current applications. *J Biomed Mater Res - Part A*. 2016;104(4):1030-1056. doi:10.1002/jbm.a.35619
10. Putri TS, Sugiura Y, Tsuru K, Ishikawa K. Fabrication of an interconnected porous β -tricalcium phosphate structure by polyacrylic acid-mediated setting reaction and sintering. *J Ceram Soc Japan*. 2020;128(8):555-559. doi:10.2109/jcersj2.20059
11. Putri TS, Rianti D, Rachmadi P, Yuliaty A. Effect of glutaraldehyde on the characteristics of chitosan-gelatin- β -tricalcium phosphate composite scaffolds. *Mater Lett*. 2021;304:130672. doi:10.1016/j.matlet.2021.130672
12. Putri TS, Elsheikh M. Flexural Strength Evaluation of Chitosan-Gelatin-B-Tricalcium Phosphate-Based Composite Scaffold. *J Int Dent Med Res*. 2022;15(1):31-34.
13. Moradi A, Pramanik S, Ataollahi F, Abdul Khalil A, Kamarul T, Pinguang-Murphy B. A comparison study of different physical treatments on cartilage matrix derived porous scaffolds for tissue engineering applications. *Sci Technol Adv Mater*. 2014;15(6):065001. doi:10.1088/1468-6996/15/6/065001
14. Haugh MG, Murphy CM, O'Brien FJ. Novel freeze-drying methods to produce a range of collagen-glycosaminoglycan scaffolds with tailored mean pore sizes. *Tissue Eng - Part C Methods*. 2010;16(5):887-894. doi:10.1089/ten.tec.2009.0422
15. Xiong L, Yang T, Yang Y, Xu C, Li F. Long-term in vivo biodistribution imaging and toxicity of polyacrylic acid-coated upconversion nanophosphors. *Biomaterials*. 2010;31(27):7078-7085. doi:https://doi.org/10.1016/j.biomaterials.2010.05.065.

The Effects of the Freeze-Drying Method on the Characteristics of A B-Tricalcium Phosphate / Polyacrylic Acid Composite Block

ORIGINALITY REPORT

9%

SIMILARITY INDEX

7%

INTERNET SOURCES

6%

PUBLICATIONS

5%

STUDENT PAPERS

PRIMARY SOURCES

1

link.springer.com

Internet Source

3%

2

Submitted to Universitas Brawijaya

Student Paper

3%

3

IRIE, Masao, Rosalina TJANDRAWINATA, Lihua E, Takashi YAMASHIRO, and Kazuomi SUZUKI. "Flexural Performance of Flowable versus Conventional Light-cured Composite Resins in a Long-term in vitro Study", Dental Materials Journal, 2008.

Publication

1%

4

Submitted to Trinity College Dublin

Student Paper

1%

Exclude quotes On

Exclude matches < 15 words

Exclude bibliography On

The Effects of the Freeze-Drying Method on the Characteristics of A B-Tricalcium Phosphate / Polyacrylic Acid Composite Block

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

/0

PAGE 1

PAGE 2

PAGE 3



Tansza Permata Setiana Putri <tansza@trisakti.ac.id>

Article Submission

1 message

Tansza Permata Setiana Putri <tansza@trisakti.ac.id>
To: jidmreditor@outlook.com

Fri, Dec 8, 2023 at 7:27 PM

Dear Prof. Dr. Izzet YAVUZ,

Please find enclosed our manuscript entitled "The effects of the freeze-drying method on the characteristics of a β -tricalcium phosphate/polyacrylic acid composite block" (running title: Freeze-dried β TCP/PAA composite block), which we request you to consider for publication as a scientific article in Journal of International Dental and Medical Research.

We attached the following documents for consideration to be reviewed.

We look forward to hearing from you at your earliest convenience.

Sincerely,

--

Tansza Permata Setiana Putri, DDS, Ph.D.

Department of Dental Materials

Faculty of Dentistry

Universitas Trisakti

Phone: +62 81 1128 0980

Email: tansza@trisakti.ac.id; tansza.putri@gmail.com

6 attachments

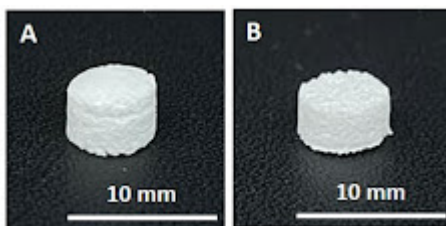


Figure 1.tif
425K

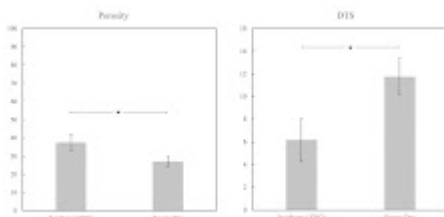






Figure 2.tif
8323K

-  **CoverLetter_RosalinaTjandrawinata.docx**
25K
-  **[BLINDED] Manuscript_Freeze-dried bTCP-PAA.doc**
458K
-  **[UNBLINDED] Manuscript_Freeze-dried bTCP-PAA.doc**
460K
-  **Transfer-of-Copyright-Agreement_RosalinaTjandrawinata.pdf**
230K



Tansza Permata Setiana Putri <tansza@trisakti.ac.id>

D23_2958_Tansza_Permata_Setiana_Putri_Indonesia

1 message

Journal of International Dental and Medical Research <jidmreditor@outlook.com>

Tue, Dec 19, 2023 at 10:42 PM

To: Tansza Permata Setiana Putri <tansza@trisakti.ac.id>

Dear author,

Your article is under the review process, when we get reviewers report then you will be informed.

sincerely yours.

Editorial Secretary for JIDMR**Courtesy of Editor-in-Chief and General Director****Journal of International Dental and Medical Research ISSN 1309 - 100X****<http://www.jidmr.com/journal/>****E-mail: jidmreditor@outlook.com****ECTODERMAL DYSPLASIA GROUP - TURKIYE****<http://www.ektodermaldisplazi.com>**

Gönderen: Tansza Permata Setiana Putri <tansza@trisakti.ac.id>**Gönderildi:** 19 Aralık 2023 Salı 15:27**Kime:** jidmreditor@outlook.com <jidmreditor@outlook.com>**Konu:** Inquiry about article submission (First Author: Rosalina Tjandrawinata)

Dear Prof. Dr. Izzet YAVUZ,

I want to ask about the submission of our manuscript entitled "The effects of the freeze-drying method on the characteristics of a β -tricalcium phosphate/polyacrylic acid composite block". Is there any confirmation that our submission has already been received?

Thank you for your attention.

Sincerely,

Tansza Permata Setiana Putri, DDS, Ph.D.

Department of Dental Materials

Faculty of Dentistry

Universitas Trisakti

Phone: +62 81 1128 0980

Email: tansza@trisakti.ac.id; tansza.putri@gmail.com**UNIVERSITAS TRISAKTI*****"Is a one stop learning for sustainable development"***

Kampus A, Jl. Kyai Tapa No.1, Grogol

Jakarta Barat 11440 - INDONESIA

www.trisakti.ac.id

(t) +62-21.566 3232, (f) +62-21.567 3001



Tansza Permata Setiana Putri <tansza@trisakti.ac.id>

D23_2958_Tansza_Permata_Setiana_Putri_Indonesia / accept letter

3 messages

Journal of International Dental and Medical Research <jidmreditor@outlook.com>

Wed, Dec 27, 2023 at 10:57 PM

To: "tansza@trisakti.ac.id" <tansza@trisakti.ac.id>

Subject: Your article has been accepted for Publication. (**The effects of the freeze-drying method on the characteristics of a β -tricalcium phosphate/polyacrylic acid composite block. Rosalina Tjandrawinata, Eddy, Jackson Dipankara, Abida Zhafira Inayasy, Thet Thet Swe, Tansza Setiana Putri**)

Dear **Prof. Dr. Tansza Setiana Putri**,

It's a great pleasure for us to inform you that, your article titled " **The effects of the freeze-drying method on the characteristics of a β -tricalcium phosphate/polyacrylic acid composite block** " has received preliminary acceptance as a result of JIDMR peer review. If you complete the publication process on time, the final acceptance process can be completed and finalized for **2024; volume 17, issue 1. It will be published in late March 2024 or early April 2024.**

Please send us the Copyright Transfer Agreement, do not forget to click <http://www.jidmr.com/journal/>, http://www.ektodermaldisplazi.com/journal/documents/Transfer_of_Copyright_Agreement.doc before sending the text.

Before sending the article to print, a print-ready copy will be sent to you for your final check.

Sincerely yours.

Open access and publication process charges for per accepted article is **1000 US\$**.

You should complete your article charges process for your accepted article ASAP, in case of late charges transfer then your accepted article can be publish other any following issue of JIDMR.

Please inform us of the "**sender's name and transaction date**" after paying the publication fee for check JIDMR account on time.

Sincerely yours.

1- By bank transfer to the my account (as 1000 US\$).

Please carefully fill in transaction form and indicate at the "Remittance Information" section over the transaction or swift bill (pay slip) section to the; Full Account Beneficiary Name, Account IBAN number and **your article ID number** .

Please inform JIDMR money order date when you did.

FINANCIAL INSTITUTION Türkiye Vakıflar Bankası T.A.O.	BANK CODE/ABA # Vakıf Bank 015
BRANCH Dicle Üniversitesi (Diyarbakir)(S0527)Bağlı Şube	ACCOUNT HOLDER / BENEFICIARY NAME# izzet yavuz
CITY/STATE/ZIP/COUNTRY Dicle Üniversitesi Kampüs Alanı Sur. Diyarbakir / 21280/ Turkey	SWIFT CODE TVBATR2A BIC CODE XXX
	IBAN / ACCOUNT NUMBER # TR190001500158048013204615

Editorial Secretary for JIDMR**Courtesy of Editor-in-Chief and General Director****Journal of International Dental and Medical Research ISSN 1309 - 100X**

<http://www.jidmr.com/journal/>

E-mail: jidmreditor@outlook.com

ECTODERMAL DYSPLASIA GROUP - TURKIYE

<http://www.ektodermaldisplazi.com>



2248 Accept letter for paper D23_2958_Tansza_Permata_Setiana_Putri_Indonesia.doc
619K

Tansza Permata Setiana Putri <tansza@trisakti.ac.id>
To: rosalina@trisakti.ac.id

Thu, Dec 28, 2023 at 6:44 AM

Tansza Permata Setiana Putri, DDS, Ph.D.

Department of Dental Materials

Faculty of Dentistry

Universitas Trisakti

Phone: +62 81 1128 0980

Email: tansza@trisakti.ac.id; tansza.putri@gmail.com

[Quoted text hidden]



2248 Accept letter for paper D23_2958_Tansza_Permata_Setiana_Putri_Indonesia.doc
619K

Tansza Permata Setiana Putri <tansza@trisakti.ac.id>
To: Journal of International Dental and Medical Research <jidmreditor@outlook.com>

Wed, Jan 3, 2024 at 10:48 AM

Dear Editorial Secretary,

We appreciate for giving us the opportunity to publish in your journal. Here I attached the payment proof for the publication charge (**sender's name: Tansza Permata S P** and **transaction date: 3 January 2024**)
Thank you very much.

Sincerely,
Tansza Putri

[Quoted text hidden]

--

[Quoted text hidden]



APC JIDMR.jpg
23K



Tansza Permata Setiana Putri <tansza@trisakti.ac.id>

D23_2958_Tansza_Permata_Setiana_Putri_Indonesia

1 message

Journal of International Dental and Medical Research <jidmreditor@outlook.com>

Wed, Jan 3, 2024 at 9:16 PM

To: Tansza Permata Setiana Putri <tansza@trisakti.ac.id>

Dear Prof. Dr. Tansza Setiana Putri,

Thank you very much for complete to the publication process.

We are very happy to inform you that your article titled " The effects of the freeze-drying method on the characteristics of a β -tricalcium phosphate/polyacrylic acid composite block " has received final acceptance approval from the advisory board as you have completed the JIDMR publication process.

Your article will be publish at the **issue 2024; volume 17, number 1** which will be released either **late March 2024** or **early April 2024**.

Before sending manuscript to press, I will send to you the press ready copy for your final checking.

Sincerely yours.

Editorial Secretary for JIDMR**Courtesy of Editor-in-Chief and General Director****Journal of International Dental and Medical Research ISSN 1309 - 100X**<http://www.jidmr.com/journal/>E-mail: jidmreditor@outlook.com**ECTODERMAL DYSPLASIA GROUP - TURKIYE**<http://www.ektodermaldisplazi.com>**Gönderen:** Tansza Permata Setiana Putri <tansza@trisakti.ac.id>**Gönderildi:** 3 Ocak 2024 Çarşamba 13:48**Kime:** Journal of International Dental and Medical Research <jidmreditor@outlook.com>**Konu:** Re: D23_2958_Tansza_Permata_Setiana_Putri_Indonesia / accept letter

Dear Editorial Secretary,

We appreciate for giving us the opportunity to publish in your journal. Here I attached the payment proof for the publication charge (**sender's name: Tansza Permata S P** and **transaction date: 3 January 2024**)
Thank you very much.

Sincerely,
Tansza Putri

On Thu, Dec 28, 2023 at 12:57 AM Journal of International Dental and Medical Research <jidmreditor@outlook.com> wrote:

Subject: Your article has been accepted for Publication. (**The effects of the freeze-drying method on the characteristics of a β -tricalcium phosphate/polyacrylic acid composite block. Rosalina Tjandrawinata, Eddy, Jackson Dipankara, Abida Zhafira Inayasary, Thet Thet Swe, Tansza Setiana Putri**)

Dear **Prof. Dr. Tansza Setiana Putri**,

It's a great pleasure for us to inform you that, your article titled " **The effects of the freeze-drying method on the characteristics of a β -tricalcium phosphate/polyacrylic acid composite block** " has received preliminary acceptance as a result of JIDMR peer review. If you complete the publication process on time, the final acceptance process can be completed and finalized for **2024; volume 17, issue 1. It will be published in late March 2024 or early April 2024.**

Please send us the Copyright Transfer Agreement, do not forget to click <http://www.jidmr.com/journal/>, http://www.ektodermaldisplazi.com/journal/documents/Transfer_of_Copyright_Agreement.doc before sending the text.

Before sending the article to print, a print-ready copy will be sent to you for your final check.

Sincerely yours.

Open access and publication process charges for per accepted article is **1000 US\$**.

You should complete your article charges process for your accepted article ASAP, in case of late charges transfer then your accepted article can be publish other any following issue of JIDMR.

Please inform us of the "**sender's name and transaction date**" after paying the publication fee for check JIDMR account on time.

Sincerely yours.

1- By bank transfer to the my account (as 1000 US\$).

Please carefully fill in transaction form and indicate at the "Remittance Information" section over the transaction or swift bill (pay slip) section to the; Full Account Beneficiary Name, Account IBAN number and **your article ID number** .

Please inform JIDMR money order date when you did.

FINANCIAL INSTITUTION Turkiye Vakiflar Bankasi T.A.O.	BANK CODE/ABA # Vakıf Bank 015
BRANCH Dicle Universitesi (Diyarbakir)(S0527)Bağlı Şube	ACCOUNT HOLDER / BENEFICIARY NAME# izzet yavuz
CITY/STATE/ZIP/COUNTRY Dicle Universitesi Kampüs Alanı Sur. Diyarbakir / 21280/ Turkey	SWIFT CODE TVBATR2A BIC CODE XXX
	IBAN / ACCOUNT NUMBER # TR190001500158048013204615

Editorial Secretary for JIDMR

Courtesy of Editor-in-Chief and General Director

Journal of International Dental and Medical Research ISSN 1309 - 100X

<http://www.jidmr.com/journal/>

E-mail: jidmreditor@outlook.com

ECTODERMAL DYSPLASIA GROUP - TURKIYE

<http://www.ektodermaldisplazi.com>

--

Tansza Permata Setiana Putri, DDS, Ph.D.

Department of Dental Materials

Faculty of Dentistry

Universitas Trisakti

Phone: +62 81 1128 0980

Email: tansza@trisakti.ac.id; tansza.putri@gmail.com



UNIVERSITAS TRISAKTI

"Is a one stop learning for sustainable development"

Kampus A, Jl. Kyai Tapa No.1, Grogol

Jakarta Barat 11440 - INDONESIA

www.trisakti.ac.id

(t) +62-21.566 3232, (f) +62-21.567 3001



Tansza Permata Setiana Putri <tansza@trisakti.ac.id>

D23_2958_Tansza_Permata_Setiana_Putri_Indonesia / Please find attached the galley proof of your article, for final check

2 messages

Journal of International Dental and Medical Research <jidmreditor@outlook.com>

Wed, Mar 27, 2024 at 11:44 PM

To: "tansza@trisakti.ac.id" <tansza@trisakti.ac.id>

Dear author,

Please find attached the galley proof of your article, for final check for the Journal of International Dental and Medical Research 2024;17(1).

You can only suggest a few minor revision fixes from mistakes made by JIDMR staff.

Please use this PDF proof for checking the editing, completeness, and correctness of the text, tables, and figures.

Any revision or all the changes made must be highlighted with Yellow-colored fonts, or it should be done in track change mode.

A point-by-point response letter must accompany your revised manuscript.

Please careful you can offer only minor corrections and comments to us within 72 hours.

If the Editor does not hear from you within three days, your article will be published as it was originally submitted.

I look forward to receiving your corrected proof if needed.

Sincerely yours,

Editorial Secretary for JIDMR**Courtesy of Editor-in-Chief and General Director****Journal of International Dental and Medical Research ISSN 1309 - 100X**<http://www.jidmr.com/journal/>E-mail: jidmreditor@outlook.com**ECTODERMAL DYSPLASIA GROUP - TURKIYE**<http://www.ektodermaldisplazi.com> **D23_2958_Tansza_Permata_Setiana_Putri_Indonesia.pdf**
521K**Tansza Permata Setiana Putri** <tansza@trisakti.ac.id>

Tue, Apr 2, 2024 at 7:35 AM

To: Journal of International Dental and Medical Research <jidmreditor@outlook.com>

Dear Editor,

I have already found our published article. Thank you for the opportunity to publish in your journal. I apologize for the late reply.

However, is it possible for us to request another page with the editorial board?

I apologize for any inconvenience.

Thank you very much.

Sincerely,
Tansza Setiana Putri

[Quoted text hidden]

--

Tansza Permata Setiana Putri, DDS, Ph.D.

Department of Dental Materials

Faculty of Dentistry

Universitas Trisakti

Phone: +62 81 1128 0980

Email: tansza@trisakti.ac.id; tansza.putri@gmail.com