

DAFTAR PUSTAKA

- Albrektsson, T. and Johansson, C. (2001) 'Osteoinduction, osteoconduction and osseointegration', *European spine journal*, 10(2), pp. S96–S101.
- Alqaheem, Y. and Alomair, A.A. (2020) 'Microscopy and spectroscopy techniques for characterization of polymeric membranes', *Membranes*, 10(2). Available at: <https://doi.org/10.3390/MEMBRANES10020033>.
- Ana, I.D., Matsuya, S. and Ishikawa, K. (2010) 'Engineering of Carbonate Apatite Bone Substitute Based on Composition-Transformation of Gypsum and Calcium Hydroxide', *Scientific Research*, 2010(May), pp. 344–352. Available at: <https://doi.org/10.4236/eng.2010.25045>.
- Astuti, A. (2016) 'Bab IV Karakterisasi Material', (July), pp. 1–12. Available at: <https://doi.org/10.13140/RG.2.1.1589.6567>.
- Babcock, R.C. *et al.* (2003) 'Identification of scleractinian coral recruits from Indo-Pacific reefs', *Zoological Studies*, 42(1), pp. 211–226.
- ZBalaji, V.R., Manikandan, D. and Ramsundar, A. (2020) 'Bone Grafts in Periodontics', pp. 57–63. Available at: <https://doi.org/10.4103/MTSM.MTSM>.
- Bansal, S. *et al.* (2009) 'Evaluation of hydroxyapatite and beta-tricalcium phosphate mixed with bone marrow aspirate as a bone graft substitute for posterolateral spinal fusion', *Indian journal of orthopaedics*, 43(3), p. 234.
- Battafarano, G. *et al.* (2021) 'Strategies for Bone Regeneration : From Graft to Tissue Engineering'.
- Britannica Online Encyclopedia (1869) 'Calcium Carbonate'.
- Campana, V. *et al.* (2014) 'Bone substitutes in orthopaedic surgery : from basic science to clinical practice', pp. 2445–2461. Available at: <https://doi.org/10.1007/s10856-014-5240-2>.
- CDC, C. for D.C. and P. (2002) 'Update: allograft-associated bacterial infections', *MMWR Morb. Mortal. Wkly. Rep.*, 51(10), pp. 207–210.
- Chen, P. *et al.* (2024) 'Applied sciences Synthesis of High-Precision Sub-Micron CaCO₃ Anticancer Drug Carriers from Coral Remains'.
- Combes, C. *et al.* (2006) 'Preparation, physical–chemical characterisation and cytocompatibility of calcium carbonate cements', *Biomaterials*, 27(9), pp. 1945–1954. Available at: <https://doi.org/https://doi.org/10.1016/j.biomaterials.2005.09.026>.
- Combes, C., Bareille, R. and Rey, C. (2006) 'Calcium carbonate–calcium phosphate mixed cement compositions for bone reconstruction', *Journal of Biomedical Materials Research Part A: An Official Journal of The Society for Biomaterials, The Japanese Society for Biomaterials, and The Australian Society for Biomaterials and the Korean Society for Biomaterials*, 79(2), pp. 318–328.
- Darwis, D. and Warastuti, Y. (2008) 'Sintesis dan Karakterisasi Komposit Hidroksiapatit (Ha) sebagai Graft Tulang Sintetik', pp. 143–153.
- Decambron, A. *et al.* (2017) 'A comparative study of tissue-engineered constructs from Acropora and Porites coral in a large animal bone defect model', *Bone and Joint Research*, 6(4), pp. 208–215. Available at: <https://doi.org/10.1302/2046-3758.64.BJR-2016-0236.R1>.
- DeCamp, C.E. (2015) *Brinker, Piermattei and Flo's handbook of small animal orthopedics and fracture repair*. Elsevier Health Sciences.
- Demers, C. *et al.* (2002) 'Natural coral exoskeleton as a bone graft substitute: a review', *Bio-medical*

- materials and engineering*, 12(1), pp. 15–35.
- Dizaj, S.M. *et al.* (2015) 'Antimicrobial Activity of Carbon-Based Nanoparticles', 5(1), pp. 19–23. Available at: <https://doi.org/10.5681/apb.2015.003>.
- Dumitrescu, A.L. (2011) 'Bone grafts and bone graft substitutes in periodontal therapy', *Chemicals in surgical periodontal therapy*, 98, pp. 73–146.
- Eriksson, A., Burcharth, J. and Rosenberg, J. (2013) 'Animal derived products may conflict with religious patients' beliefs', *BMC medical ethics*, 14, pp. 1–5.
- Esbah Tabaei, P.S. *et al.* (2021) 'Combinatorial effects of coral addition and plasma treatment on the properties of chitosan/polyethylene oxide nanofibers intended for bone tissue engineering', *Carbohydrate Polymers*, 253(September), p. 117211. Available at: <https://doi.org/10.1016/j.carbpol.2020.117211>.
- Ferraz, M.P. (2023) 'Bone Grafts in Dental Medicine: An Overview of Autografts, Allografts and Synthetic Materials', *Materials*, 16(11), pp. 1–22. Available at: <https://doi.org/10.3390/ma16114117>.
- Fesseha, H. and Fesseha, Y. (2020) 'Bone Grafting, Its Principle and Application: A Review', *Osteol Rheumatol Open J*, 1(1), pp. 43–50. Available at: <https://doi.org/10.17140/ORHOJ-1-113>.
- Fitri, N., Yusibani, E. and Yufita, E. (2016) 'Identifikasi Kandungan Material Perekat pada Benteng Purba di Kawasan Aceh Besar Menggunakan XRF Identification of Adhesive Material Substance in Ancient Fortress Located at Aceh Besar using XRF', *Physics Sociesty*, 5(2), pp. 14–18.
- Fleet, M.E., Liu, X. and Lu, X. (2011) 'Orientation of channel carbonate ions in apatite : Effect of pressure and composition', *American Mineralogist*, 96(2), pp. 1148–1157. Available at: <https://doi.org/10.2138/am.2011.3683>.
- Florencio-silva, R. *et al.* (2015) 'Biology of Bone Tissue: Structure , Function , and Factors That Influence Bone Cells', 2015.
- Fu, K. *et al.* (2013) 'Characterization of a biodegradable coralline hydroxyapatite/calcium carbonate composite and its clinical implementation', *Biomedical Materials (Bristol)*, 8(6). Available at: <https://doi.org/10.1088/1748-6041/8/6/065007>.
- García-Gareta, E., Coathup, M.J. and Blunn, G.W. (2015) 'Osteoinduction of bone grafting materials for bone repair and regeneration', *Bone*, 81, pp. 112–121.
- Gesteinslabor and Jahns, E. (2024) *X-ray diffraction (XRD) and Fourier transform infrared (FTIR) spectroscopy*, Gesteinslabor. Available at: <https://www.gesteinslabor.de/en/xrd-and-ftir.html> (Accessed: 20 February 2024).
- Gökmenoğlu, C. (2016) 'Treatment of Different Types of Bone Defects with Concentrated Growth Factor: Four Case Reports', *International Journal of Oral and Dental Health*, 2(2), pp. 3–5. Available at: <https://doi.org/10.23937/2469-5734/1510029>.
- Goldberg, V.M. and Stevenson, S. (2005) 'The biology of bone grafts.', *Seminars in arthroplasty*, 4(2), pp. 58–63.
- Gosseau, D. (2009) *Introduction to XRF Spectroscopy*. Plenum, New York.
- Goyal, D., Goyal, A. and Brittberg, M. (2013) 'Consideration of religious sentiments while selecting a biological product for knee arthroscopy', *Knee Surgery, Sports Traumatology, Arthroscopy*, 21, pp. 1577–1586.
- Greenberg, D.D. *et al.* (2010) 'Allograft compared with autograft infection rates in primary anterior

- cruciate ligament reconstruction', *JBJs*, 92(14), pp. 2402–2408.
- Gunn, J.M. *et al.* (2013) 'Comparison of the osteoconductive properties of three particulate bone fillers in a rabbit model: Allograft, calcium carbonate (Biocoral) and S53P4 bioactive glass', *Acta Odontologica Scandinavica*, 71(5), pp. 1238–1242. Available at: <https://doi.org/10.3109/00016357.2012.757642>.
- Hasanah, N. (2017) *Pengaruh Implantasi Scaffold Xenograft Aseluler, Prp (Platelet Rich Plasma) Dan Kombinasi Keduanya Terhadap Ekspresi Interleukin-10 Dan Jumlah Sel Fibroblas Di Subkutan Abdomen Tikus (Rattus norvegicus) Pada Uji Biokompatibilitas Respon Imun Akut*.
- Hatamleh, M.M., Hatamlah, H.M. and Nuseir, A. (2023) 'Maxillofacial prosthetics and digital technologies: Cross-sectional study of healthcare service provision, patient attitudes, and opinions', *Journal of Prosthodontics* [Preprint].
- He, F. *et al.* (2015) 'In vitro degradation and cell response of calcium carbonate composite ceramic in comparison with other synthetic bone substitute materials', *Materials Science & Engineering C*, 50, pp. 257–265. Available at: <https://doi.org/10.1016/j.msec.2015.02.019>.
- Hermawan, M.R. (2017) *Karakterisasi Material Bantalan Luncur*. UNPAS.
- Islamiyati, A.D. and Abram, P.H. (2020) 'Analisis Kadar Kalsium Oksida (CaO) pada Batu Karang di Daerah Pesisir Bayang Dampelas Donggala', *Media Eksakta*, 16(1), pp. 57–62.
- Jahangir, A.A. *et al.* (2008) 'Bone-graft substitutes in orthopaedic surgery', *AAOs now*, 2(1), pp. 35–37.
- Jamaluddin (2016) *Analisis Kandungan Logam Oksida Menggunakan Metode XRF (X-Ray Fluorescence)*, Universitas Hasanuddin.
- Jenkins, E.D. *et al.* (2010) 'Informed consent: cultural and religious issues associated with the use of allogeneic and xenogeneic mesh products', *Journal of the American College of Surgeons*, 210(4), pp. 402–410.
- Joshi, D.O. *et al.* (2010) 'Bone grafting: An overview', *Veterinary World*, 3(4), pp. 198–200.
- Julia, V. *et al.* (2016) 'The use of coral scaffold in oral and maxillofacial surgery: A review', *Journal of International Dental and Medical Research*, 9(Specialissue), pp. 427–435.
- Kee, N. *et al.* (2007) 'Preferential incorporation of adult-generated granule cells into spatial memory networks in the dentate gyrus', *Nature neuroscience*, 10(3), pp. 355–362.
- Kench, P., Perry, C. and Spencer, T. (2019) *7 Coral reefs*.
- Khan, S.N. *et al.* (2005) 'The biology of bone grafting', *JAAOS-Journal of the American Academy of Orthopaedic Surgeons*, 13(1), pp. 77–86.
- Kirboga, S. and Oner, M. (2020) 'Effect of the Experimental Parameters on Calcium Carbonate Precipitation', *The Italian Association of Chemical Engineering*, 32(January 2013). Available at: <https://doi.org/10.3303/CET1332354>.
- Kular, J. *et al.* (2012) 'An overview of the regulation of bone remodelling at the cellular level', *Clinical Biochemistry*, 45(12), pp. 863–873. Available at: <https://doi.org/10.1016/j.clinbiochem.2012.03.021>.
- Kumar, J. *et al.* (2016) 'Journey of Bone Graft Materials in Periodontal Therapy: A Chronological Review', pp. 30–34. Available at: <https://doi.org/10.4103/2277-4696.185195>.
- Kumar, P., Vinitha, B. and Fathima, G. (2013) 'Bone grafts in dentistry', *Journal of Pharmacy and Bioallied Sciences*, 5(SUPPL.1), pp. 125–128. Available at: <https://doi.org/10.4103/0975-7406.113312>.

- Kurniawan, A.F. (2015) *Studi Pengaruh Penambahan Kalsium Klorida (CaCl₂) dan Variasi pH Terhadap Produksi Etanol Oleh flocculent Saccharomyces cerevisiae*. Universitas Brawijaya.
- Kursteiner, P. and Soom, M. (2017) 'Calcit-Funde der Schweiz', (February).
- Laurencin, C., Khan, Y. and El-Amin, S.F. (2006) 'Bone graft substitutes', *Expert review of medical devices*, 3(1), pp. 49–57.
- Leal, M.C. *et al.* (2013) 'Coral aquaculture to support drug discovery', *Trends in Biotechnology*, 31(10), pp. 555–561.
- Lee, B.W. (2021) 'Preparation of hydroxyapatite by aqueous precipitation from calcium carbonate and phosphoric acid', *IOP Conference Series: Materials Science and Engineering*, 1113(1), p. 012013. Available at: <https://doi.org/10.1088/1757-899x/1113/1/012013>.
- Luthfi O M, G. dan N.A.N. (2016) *Identifikasi morfologi karang massive porites di perairan laut selatan jawa, Seminar Nasional Perikanan dan Kelautan VI, Fakultas Perikanan dan Ilmu Kelautan, Universitas Brawijaya Malang*.
- Madupalli, H., Pavan, B. and Tecklenburg, M.M.J. (2017) 'Carbonate substitution in the mineral component of bone: Discriminating the structural changes, simultaneously imposed by carbonate in A and B sites of apatite', *Journal of Solid State Chemistry*, 255, pp. 27–35. Available at: <https://doi.org/10.1016/j.jssc.2017.07.025>.
- Mahyudin, F. (2018) *Graft Tulang dan Material Pengganti Tulang*. 1st edn. Edited by D.N. Utomo. Surabaya: Airlangga University Press.
- Mahyudin, F., Rushadi, D. and Rantam, F.A. (2011) 'Regenerasi pada Massive Bone Defect dengan Bovine Hydroxyapatite sebagai Scaffold Mesenchymal Stem Cell', *Journal Biosains Pascasarjana*, 13(3), pp. 179–195.
- Maiti, S.K., Singh, G.R. and Mogha, I. V (2002) 'Bone allografts: A review', *Indian Journal of Veterinary Surgery*, 23(1), pp. 1–11.
- Manassero, M. *et al.* (2013) 'Bone regeneration in sheep using acropora coral, a natural resorbable scaffold, and autologous mesenchymal stem cells', *Tissue Engineering - Part A*, 19(13–14), pp. 1554–1563. Available at: <https://doi.org/10.1089/ten.tea.2012.0008>.
- Martinez, S.A. and Walker, T. (1999) 'Bone grafts', *Veterinary Clinics of North America: Small Animal Practice*, 29(5), pp. 1207–1219.
- Matuda, Y. *et al.* (2019) 'Original Periodontal Regeneration Using Cultured Coral Scaffolds in Class II Furcation Defects in Dogs', pp. 329–334.
- Miron, R.J. (2023) 'Optimized bone grafting', (July), pp. 1–18. Available at: <https://doi.org/10.1111/prd.12517>.
- Montoya-Escobar, N. *et al.* (2022) 'Use of Fourier Series in X-ray Diffraction (XRD) Analysis and Fourier-Transform Infrared Spectroscopy (FTIR) for Estimation of Crystallinity in Cellulose from Different Sources', *Polymers*, 14(23). Available at: <https://doi.org/10.3390/polym14235199>.
- Noble, B.S. and Reeve, J. (2000) 'Osteocyte function , osteocyte death and bone fracture resistance', 159, pp. 7–13.
- Oktaviani, T. *et al.* (2018) 'Tingkat Kelangsungan Hidup Spat Kerang Mutiara (*Pinctada maxima*) dengan Kepadatan Berbeda di Balai Perikanan Budidaya Laut Lombok', *Jurnal Kelautan*, 11(1), pp. 47–55.
- Omer, M. (2021) *Mechanical Behavior of Bioceramic Materials: Case Study of Skeleton of The Staghorn Coral, Acropora cervicornis and The Skeleton of The Staghorn Coral, Acropora cervicornis and*

The Tibia of The Laboratory Mouse, Mus Musculus, University of Central Florida. Available at: <https://stars.library.ucf.edu/etd2020/541>.

- Pisulkar, S., Pakhan, A.J. and Godbole, S.R. (2018) 'Psychological considerations in patients with maxillofacial defects: a literature review', *Journal of School of Advanced Studies*, 1(2), pp. 57–60.
- Pountos, I. and Giannoudis, P. V (2016) 'Is there a role of coral bone substitutes in bone repair?', *Injury*. Elsevier Ltd, pp. 2606–2613. Available at: <https://doi.org/10.1016/j.injury.2016.10.025>.
- Prakash, P., Bahri, R. and Bhandari, S K (2021) 'Maxillofacial Defects: Impact on Psychology and Esthetics', in *Beauty-Cosmetic Science, Cultural Issues and Creative Developments*. IntechOpen.
- Prakash, P., Bahri, R. and Bhandari, S.K. (2021) 'Maxillofacial Defects: Impact on Psychology and Esthetics', in *Maxillofacial Defects*. Intechopen, pp. 1–7.
- Purnama, D. *et al.* (2020) 'Keanekaragaman Jenis Karang Pada Kedalaman 1-5 Meter Diperairan Pulau Tikus, Kota Bengkulu', *Angewandte Chemie International Edition*, 6(11), 951–952., 5(3), pp. 529–547. Available at: <https://doi.org/DOI:https://doi.org/10.31186>.
- Raymond, A. (1994) 'Clinical Evaluation of Coralline Calcium Carbonate as a Bone Replacement Graft Material in Human Periodontal Osseous Defects *', *J Periodontol*, 1(February), pp. 177–185.
- Rezky H, M. (2022) *Biodiversitas dan Karakteristik Morfologi Karang Acropora di Kepulauan Spermonde*. Universitas Hasanuddin.
- Rezky, M.Y.R. (2019) *Biodiversitas Dan Karakteristik Morfologi Karang Acropora Di Kepulauan Spermonde*.
- Ripamonti, U. *et al.* (2009) 'The induction of bone formation by coral-derived calcium carbonate/hydroxyapatite constructs', *Biomaterials*, 30(7), pp. 1428–1439.
- Rushadi, D. and Rantam, F.A. (2011) 'Regenerasi pada Massive Bone Defect dengan Bovine Hydroxyapatite sebagai Scaffold Mesenchymal Stem Cell (Regeneration of Massive Bone Defect with Bovine Hydroxyapatite as Scaffold of Mesenchymal Stem Cells)', 13(3), pp. 179–195.
- Samavedi, S., Whittington, A.R. and Goldstein, A.S. (2013) 'Acta Biomaterialia Calcium phosphate ceramics in bone tissue engineering: A review of properties and their influence on cell behavior', *Acta Biomaterialia*, 9(9), pp. 8037–8045. Available at: <https://doi.org/10.1016/j.actbio.2013.06.014>.
- Saputri, R.A., Widyorini, N. and Purnomo, W. (2016) 'Identification and Abundance of Bacteria In Acropora sp . at Coral Reef Flat Panjang Island Jepara', *Journal of Fisheries Science and Technology (JFST)*, 12(1), pp. 35–39.
- Sellang, H. and Pi, S. (2020) *Biologi Perairan*. Penerbit Lakeisha.
- Shukla, S. *et al.* (2019) 'Optimal management of intrabony defects : current insights', *Clinical, Cosmetic and Investigational Dentistry*, 11(1), pp. 19–25.
- Siswanto *et al.* (2021) 'Effect of pH condition during sol-gel synthesis on the volume fraction of hydroxyapatite from sea coral', *Journal of Physics: Conference Series*, 1825(1). Available at: <https://doi.org/10.1088/1742-6596/1825/1/012045>.
- Sivakumar, M. *et al.* (1996) 'Development of hydroxyapatite derived from Indian coral', *Biomaterials*, 17(17), pp. 1709–1714.
- Stevenson, S. (1999) 'Biology of bone grafts', *Orthopedic Clinics*, 30(4), pp. 543–552.

- Suharsono (2008) *Jenis-jenis karang di Indonesia (Reefs in Indonesia)*.
- Sumantry, T. (2013) *Aplikasi XRF untuk identifikasi lempung pada kegiatan penyimpanan lestari limbah radioaktif*, *Buletin Limbah*.
- Tovar, N. *et al.* (2014) 'Evaluation of bone response to various anorganic bovine bone xenografts: An experimental calvaria defect study', *International Journal of Oral and Maxillofacial Surgery*, 43(2), pp. 251–260. Available at: <https://doi.org/10.1016/j.ijom.2013.07.005>.
- Truesdell, S.L. and Saunders, M.M. (2019) 'Bone remodeling platforms : Understanding the need for multicellular lab-on-a-chip systems and predictive agent-based models', 17(July), pp. 1233–1252. Available at: <https://doi.org/10.3934/mbe.2020063>.
- Türk, S. *et al.* (2019) 'Effect of Solution and Calcination Time on Sol – gel Synthesis of Hydroxyapatite', 16, pp. 311–318.
- Umemoto, S. *et al.* (2021) 'In Vivo Bioresorbability and Bone Formation Ability of Sintered Highly Pure Calcium Carbonate granules', *Dental Materials Journal*, 40(5), pp. 1202–1207. Available at: <https://doi.org/10.4012/dmj.2020-254>.
- Vaikundamoorthy, R. and Sundaramoorthy, R. (2016) 'Marine steroid derived from *Acropora formosa* enhances mitochondrial-mediated apoptosis in non-small cell lung cancer cells'. Available at: <https://doi.org/10.1007/s13277-016-4947-8>.
- Viklund, A. (2017) *Teknik Pemeriksaan Material Menggunakan XRF, XRD dan SEM-EDS*.
- Wahab, W. (2022) *Penggunaan xenograft sebagai bahan cangkok tulang pada perawatan periodontal regeneratif: systematic review*. Universitas Hsanuddin.
- Wang, W. and Yeung, K.W.K. (2017) 'Bone grafts and biomaterials substitutes for bone defect repair: A review', *Bioactive Materials*, 2(4), pp. 224–247. Available at: <https://doi.org/10.1016/j.bioactmat.2017.05.007>.
- Wang, Y., Miron, R.J. and Zhang, Y. (2019) 'Next-Generation Ion Incorporation into Bone Grafts for Bone and Periodontal Regeneration', (January).
- Wang, Z. *et al.* (2015) 'Osteoblastic mesenchymal stem cell sheet combined with Choukroun platelet-rich fibrin induces bone formation at an ectopic site', *Journal of Biomedical Materials Research - Part B Applied Biomaterials*, 103(6), pp. 1204–1216. Available at: <https://doi.org/10.1002/jbm.b.33288>.
- Warastuti, Y., Abbas, B. and Suryani, N. (2017) 'Konversi Karang Laut Menjadi Hidroksiapatit dengan Metode Sonikasi', *Jurnal Kimia dan Kemasan*, 39(2), pp. 79–86. Available at: <https://doi.org/doi.org/10.24817/jkk.v39i2.3012>.
- Wardhani, S., Azkiya, N.I. and Tjahjanto, R.T. (2018) 'Synthesis of Hydroxyapatite using Precipitated Calcium Carbonate (PCC) from Limestones', *IOP Conference Series: Materials Science and Engineering*, 299(1). Available at: <https://doi.org/10.1088/1757-899X/299/1/012035>.
- Warren, B.E. (1969) 'X-ray Difraction', *Addison Wesley Pub. Co., Reading, MA*, 375, pp. 379–388.
- Warren, B.E. (1990) *X-ray Diffraction*. Courier Corporation.
- Xian, H. *et al.* (2020) 'Platelet-Rich Plasma-Incorporated Autologous Granular Bone Grafts Improve Outcomes of Post-Traumatic Osteonecrosis of the Femoral Head', *Journal of Arthroplasty*, 35(2), pp. 325–330. Available at: <https://doi.org/10.1016/j.arth.2019.09.001>.
- Xiao, B. *et al.* (2021) 'Effects of Microplastics Exposure on the *Acropora* sp. Antioxidant, Immunization and Energy Metabolism Enzyme Activities', *Frontiers in Microbiology*, 12(June). Available at: <https://doi.org/10.3389/fmicb.2021.666100>.

- Xu, Y. *et al.* (2001) 'Hydrothermal conversion of coral into hydroxyapatite', *Materials Characterization*, 47(2), pp. 83–87.
- Yafie, M. *et al.* (2022) 'Biodiversitas Genus *Acropora* (Ordo Scleractinia) di Kepulauan Spermonde. Coral Triangle Indonesia Biodiversity', *Jurnal Ilmu Kelautan Kepulauan*, 5(2), pp. 585–597.
- Yu, H. *et al.* (2010) 'Bioinspired fabrication of 3D hierarchical porous nanomicrostructures of calcium carbonate for bone regeneration w', (C), pp. 6578–6580. Available at: <https://doi.org/10.1039/c0cc01348j>.
- Yudin, M. (2022) *Efektifitas Bonegraft yang Mengandung Cangkak Kerang Mutiara (PINCTADA MAXIM) terhadap Ekpresi BMP-2 pada Regenerasi Tulang*. Universitas Hasanuddin.
- Zakaria (2003) *Analisis Kandungan Mineral Magnetik pada Batuan Beku dari Daerah Istimewa Yogyakarta dengan Metode X-Ray Diffraction*. skripsi, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Haluoleo : Kendari.

Lampiran 1. Surat Izin Penelitian

	<p>KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET, DAN TEKNOLOGI UNIVERSITAS HASANUDDIN FAKULTAS KEDOKTERAN GIGI Jalan Perintis Kemerdekaan Km. 10, Makassar 90245 Telepon (0411) 586012, Faksimile (0411) 584641 Laman www.uhsu.ac.id Email fidhs@uhsu.ac.id</p>
<p>Nomor : 02170/UN4.13/PT.01.04/2023 6 Juni 2023 Hal : Izin Penelitian</p>	
<p>Yth. 1. Dekan Fakultas MIPA 2. Kepala Laboratorium Politeknik Kimia Universitas Hasanuddin Makassar</p>	
<p>Dengan hormat kami sampaikan bahwa mahasiswa Program Studi Pendidikan Dokter Gigi Spesialis (PPDGS) Ilmu Bedah Mulut dan Maksilofasial Fakultas Kedokteran Gigi Universitas Hasanuddin bermaksud untuk melakukan penelitian.</p>	
<p>Selubungan dengan hal tersebut, mohon kiranya dapat diberikan izin penelitian kepada peneliti di bawah ini:</p>	
<p>Nama / NIM : drg. Maulana Muslim / J045191045 Waktu Penelitian : November 2022 s.d. April 2023 Tempat Penelitian : Laboratorium Politeknik Kimia Universitas Hasanuddin dan Laboratorium Penelitian dan Pengembangan Sains Fakultas MIPA Universitas Hasanuddin Pembimbing : 1. Prof. Muhammad Ruslin, drg., M.Kes., Ph.D., Sp.BM.M.Subsp.Ortognat-D(K) 2. Yosy Yocita Aristiana, drg., M.K.G., Sp.BM.M. Subsp.Ortognat-D (K) Judul Penelitian : Identifikasi Senyawa Kalsium Karbonat pada <i>Acryoxa Sp</i> sebagai Bahan Pengganti Rekonstruksi Tulang Maksilofasial</p>	
<p>Demikian permohonan kami, atas perhatian dan kerjasamanya yang baik diucapkan terima kasih.</p>	
<p>a.n. Dekan, Wakil Dekan Bidang Akademik dan Kemahasiswaan</p>  <p>Acing Habibie Made, drg., Ph.D., Sp.Prox., Subsp.OGST(K). NIP 198102072008121002</p>	
<p>Tembusan: 1. Dekan FKG Unhas; 2. Kepala Bagian Tata Usaha FKG Unhas; 3. Kepala Laboratorium Penelitian dan Pengembangan Sains FMIPA Unhas.</p>	



Lampiran 2. Rekomendasi Persetujuan Etik



REKOMENDASI PERSETUJUAN ETIK

Nomor: 0111/PL.09/KEPK-FKG-RSGM UNHAS/2023

Tanggal: 23 Juni 2023

Dengan ini menyatakan bahwa protokol dan dokumen yang berhubungan dengan protokol berikut ini telah mendapatkan persetujuan etik:

No. Protokol	UH 17120850	No Protokol Sponsor	
Peneliti Utama	drg. Maulana Muslim	Sponsor	Pribadi
Judul Peneliti	Identifikasi Senyawa Acropora Sp sebagai Pengganti Konstruksi Tulang Maksilofasial		
No. Versi Protokol	1	Tanggal Versi	19 Juni 2023
No. Versi Protokol		Tanggal Versi	
Tempat Penelitian	Rumah Sakit Utama dan Rumah sakit jejaring di Kota makassar		
Dokumen Lain			
Jenis Review	<input type="checkbox"/> Exempted <input checked="" type="checkbox"/> Expedited <input type="checkbox"/> Fullboard	Masa Berlaku 23 Juni 2023-23 Juni 2024	Frekuensi Review Lanjutan
Ketua Komisi Etik Penelitian	Nama: Dr. drg. Marhamah, M.Kes	Tanda Tangan 	Tanggal
Sekretaris Komisi Etik Penelitian	Nama: drg. Muhammad Ibbal, Sp.Pros	Tanda Tangan 	Tanggal

Kewajiban peneliti utama:

- Menyerahkan Amandemen Protokol untuk persetujuan sebelum diimplementasikan
- Menyerahkan laporan SAE ke Komisi Etik dalam 24 jam dan dilengkapi dalam 7 hari dan lapor SUSAR dalam 72 jam setelah peneliti utama menerima laporan.
- Menyerahkan laporan kemajuan (*progress report*) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah.
- Menyerahkan laporan akhir setelah penelitian berakhir.
- Melaporkan penyimpangan dari protokol yang disetujui (*protocol deviation/violation*)
- Mematuhi semua aturan yang berlaku.

Lampiran 3. Pengambilan sampel *Acropora* sp bersama tim peneliti di Pulau Kodingareng



Lampiran 4. *Grinding* atau penggilingan sampel coral *Acropora* sp



Lampiran 5. *Shieving* atau pengayakan sampel *coral Acropora* sp sampai didapatkan hasil bubuk berukuran 120 mesh



Lampiran 6. Proses pemeriksaan XRF sampel *coral Acropora* sp



Lampiran 7. Proses pemeriksaan XRD sampel *coral Acropora* sp



Lampiran 8. Riwayat hidup penulis

**A. Data Pribadi**

1. Nama : Maulana Muslim
2. Tempat, tgl. Lahir : Longkali, 12 Juni 1984
3. Alamat : Perum. Griya Alam Permai Blok F 16, Tamalanrea, Makassar
4. Kewarnageraan : Indonesia

B. Riwayat Pendidikan

1. SDN 1 Longkali 1989-1995
2. SMPN 1 Longkali 1995-1998
3. SMAN 3 Poso 1998-2001
4. S1 (S.Kg) Fakultas Kedokteran Gigi Universitas Hasanuddin 2001-2006
5. Profesi (drg) Fakultas Kedokteran Gigi Universitas Hasanuddin 2006-2011
6. PPDGS Bedah Mulut dan Maksilofasial Universitas Hasanuddin 2019-sekarang.

C. Pekerjaan dan Riwayat Pekerjaan

1. Jenis Pekerjaan : PNS
2. NIP : 198406122015031001
3. Pangkat/Jabatan : Dokter Madya

D. Karya ilmiah yang telah dipublikasikan:

Muslim Maulana et al. 2023. Management of epulis fissuratum with excision and vestibuloplasty. Makassar Dental Journal 12 (3), 442-444; doi.org/10.35856/mdj.v12i3.881