

## DAFTAR PUSTAKA

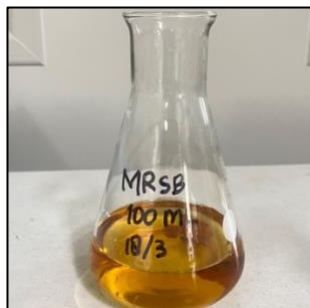
- Abdelhamid, A. G., Esaam, A., & Hazaa, M. M. (2018). Cell free preparations of probiotics exerted antibacterial and antibiofilm activities against multidrug resistant *E. coli*. *Saudi pharmaceutical journal*, 26(5), 603-607.
- Allkja, J., van Charante, F., Aizawa, J., Reigada, I., Guarch-Perez, C., Vazquez-Rodriguez, J. A., ... & Goeres, D. M. (2021). Interlaboratory study for the evaluation of three microtiter plate-based biofilm quantification methods. *Scientific reports*, 11(1), 13779.
- Almatroudi, A. (2024). Investigating Biofilms: Advanced Methods for Comprehending Microbial Behavior and Antibiotic Resistance. *Frontiers in Bioscience-Landmark*, 29(4), 133
- Arunkumar, M., LewisOscar, F., Thajuddin, N., Pugazhendhi, A., & Nithya, C. (2020). In vitro and in vivo biofilm forming *Vibrio* spp: a significant threat in aquaculture. *Process Biochemistry*, 94, 213-223.
- Ashrafudoulla, M., Na, K. W., Hossain, M. I., Mizan, M. F. R., Nahar, S., Toushik, S. H., Roy, P.K., Park, S.H., dan Ha, S. D. (2021). Molecular and pathogenic characterization of *Vibrio parahaemolyticus* isolated from seafood. *Marine Pollution Bulletin*, 172, 112927.
- Astuti, S. D., Rulaningtyas, R., Putra, A. P., & Arifianto, D. (2020). The efficacy of photodynamic inactivation with laser diode on *Staphylococcus aureus* biofilm with various ages of biofilm. *Infectious disease reports*, 12(s1), 8736.
- Austin, B. and X.H Zhang. 2006. *Vibrio parahaemolyticus*: A Significant Pathogen of Marine Vertebrates and Invertebrates. *Lett. Appl. Microbiol*, 43:119–124.
- Badan Pusat Statistik Sulawesi Selatan. Produksi Perikanan Laut yang Dijual di Tempat Pelelangan Ikan Provinsi Sulawesi Selatan 2021.
- Bahar, Y., & Septianawati, P. (2018). Pengaruh Ekstrak Etanol Daun Kemangi (*Ocimum Basilicum* L Folium) Terhadap Kadar Sgot Dan Sgpt Tikus Putih (*Rattus Norvegicus* Strain Wistar) Yang Diinduksi Msg. *Herb-Medicine Journal: Terbitan Berkala Ilmiah Herbal, Kedokteran dan Kesehatan*, 1(1).
- Beal, J., Farny, N. G., Haddock-Angelli, T., Selvarajah, V., Baldwin, G. S., Buckley-Taylor, R., & Paris Bettencourt Ameziane Annissa. (2020). Robust estimation of bacterial cell count from optical density. *Communications biology*, 3(1), 512.
- Chen, B., Huang, J., Li, H., Zeng, Q. H., Wang, J. J., Liu, H., Pan, Y., dan Zhao, Y. (2020). Eradication of planktonic *Vibrio parahaemolyticus* and its sessile biofilm by curcumin-mediated photodynamic inactivation. *Food Control*, 113, 107181.

- Ceccarelli, D., Hasan, N. A., Huq, A., & Colwell, R. R. (2013). Distribution and dynamics of epidemic and pandemic *Vibrio parahaemolyticus* virulence factors. *Frontiers in Cellular and Infection Microbiology*, 3, Article 97.
- Doucet, A. N., Slipski, C. J., Golding, G. R., Mulvey, M. R., & Bay, D. C. (2022). Generation of greater bacterial biofilm biomass using PCR-Plate deep well microplate devices. *JoVE (Journal of Visualized Experiments)*, (182), e63069.
- Emanuel, V., Adrian, V., Ovidiu, P. & Gheorghe, C. (2005). Isolation of a *Lactobacillus plantarum* strain used for obtaining a product for the preservation of fodders. *African Journal of Biotechnology*, 4, 403–408.
- Famuyide, I. M., Aro, A. O., Fasina, F. O., Eloff, J. N., & McGaw, L. J. (2019). Antibacterial and antibiofilm activity of acetone leaf extracts of nine under-investigated south African *Eugenia* and *Syzygium* (Myrtaceae) species and their selectivity indices. *BMC complementary and alternative medicine*, 19, 1-13.
- Folliero, V., Franci, G., Dell'Annunziata, F., Giugliano, R., Foglia, F., Sperlongano, R., & Galdiero, M. (2021). Evaluation of antibiotic resistance and biofilm production among clinical strain isolated from medical devices. *International journal of microbiology*, 2021.
- Hidayah, H., Iin, L. P., Mursal, Hawa, A. S., & Surya, A. (2022). Analisis Cemaran Bakteri Coliform dan Identifikasi *Escherichia coli* pada Es Batu Balok di Kota Karawang. *Arma Xplore–Jurnal Sains dan Ilmu Farmasi*, 7(1), 54–68.
- Jeyanathan, A., Ramalhete, R., Blunn, G., Gibbs, H., Pumilia, C., Meckmongkol, T., Lovejoy, J., & Coathup, M. (2021). *Lactobacillus* cell-free supernatant as a novel bioagent and biosurfactant against *Pseudomonas aeruginosa* in the prevention and treatment of orthopedic implant infection. *Journal of biomedical materials research. Part B, Applied biomaterials*.
- Katzung, Betram G. (2012). *Farmakologi Dasar dan Klinis Edisi 10*. EGC. Jakarta.
- Kining, Ekajayanti, Syamsul Falah & Novik Nurhidayati. (2016). The *In Vitro* Antibiofilm Activity of Water Leaf Extract of Papaya (*Carica papaya* L.) Against *Pseudomonas aeruginosa*. *Current Biochemistry*. 2(3), 150-163.
- Kirmusaoglu, S. (2019). *The Method for Detection of Biofilm and Screening Antibiofilm Agents. Antimicrobial, Antibiotic Resistance, Antibiofilm Strategies and Activity Methods*, IntechOpen, p. 1-17.

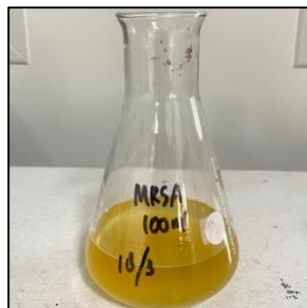
- Lee, J. E., Lee, N. K., & Paik, H. D. (2021). Antimicrobial and anti-biofilm effects of probiotic *Lactobacillus plantarum* KU200656 isolated from kimchi. *Food Science and Biotechnology*, 30, 97-106
- Li, Y. J., Yang, Y. F., Zhou, Y. J., Zhang, R. H., Liu, C. W., Liu, H., & Wu, Y. N. (2022). Estimating the burden of foodborne gastroenteritis due to nontyphoidal *Salmonella enterica*, *Shigella* and *Vibrio parahaemolyticus* in China. *PLoS One*, 17(11), e0277203.
- Li, Y., Dong, R., Ma, L., Qian, Y., & Liu, Z. (2022). Combined anti-biofilm enzymes strengthen the eradicate effect of *Vibrio parahaemolyticus* biofilm: Mechanism on *cpsA-J* expression and application on different carriers. *Foods*, 11(9), 1305.
- Lucero-Mejía, J. E., Romero-Gómez, S. D. J., & Hernández-Iturriaga, M. (2020). A new classification criterion for the biofilm formation index: a study of the biofilm dynamics of pathogenic *Vibrio* species isolated from seafood and food contact surfaces. *Journal of Food Science*, 85(8), 2491-2497.
- Lv, X., Cui, T., Du, H., Sun, M., Bai, F., Li, J., & Zhang, D. (2021). *Lactobacillus plantarum* CY 1-1: A novel quorum quenching bacteria and anti-biofilm agent against *Aeromonas sobria*. *Lwt - Food Science and Technology*, 137, 110439.
- Mohsenipour, Zeinab & Mehdi Hasanshahian. (2015). The Effects of *Allium sativum* Extracts on Biofilm Formation and Activities of Six Pathogenic Bacteria. *Jundishapur Journal Microbiology*. 8(8), 1-7.
- Morsy, T. A., Abou-Elmagd, A. I., Abdallah, A. M., & El-Shahat, S. A. (2023). Assessment On Foodborne Diseases (Gastroenteritis) With Increased Climatic Conditions: A Review Article. *Journal Of The Egyptian Society Of Parasitology*, 53(1), 165-184.
- Mosriula, M. (2019). Analysis of land suitability, carrying capacity, and development strategies for seaweed cultivation in Labakkang District, Pangkep Regency, Indonesia. *Akuatikisile: Jurnal Akuakultur, Pesisir dan Pulau-Pulau Kecil*, 3(2), 81-90.
- Nurhafizah, W. W. I., Lee, K. L., Nadirah, M., Danish-Daniel, M., Zainathan, S. C., & Najiah, M. (2021). Virulence properties and pathogenicity of multidrug-resistant *Vibrio harveyi* associated with luminescent vibriosis in Pacific white shrimp, *Penaeus vannamei*. *Journal of Invertebrate Pathology*, 186, 107594.
- Onbas, T., Osmanagaoglu, O., & Kiran, F. (2018). Potential Properties of *Lactobacillus plantarum* F-10 as a Bio-control Strategy for Wound Infections. *Probiotics and Antimicrobial Proteins*, 1-14.

- Prabowo, A. (2019). Pengaruh Penambahan Tepung Krokot (*Pertulaca Oleracea* L) Pada Pakan Terhadap Jumlah Moulting, Pertumbuhan Dan Kelulushidupan Udang Vannamei (*Litopenaeus Vannamei*).
- Qiao, Y., Feng, L., Jia, R., Luo, Y., & Yang, Q. (2022). Motility, biofilm formation and associated gene expression in *Vibrio parahaemolyticus* impaired by co-culture with live *Ulva fasciata*. *Journal of Applied Microbiology*, 132(1), 101-112.
- Ramírez, M., Groot, M., Smid, E., Hols, P., Kleerebezem, M., & Abee, T. (2018). Role of cell surface composition and lysis in static biofilm formation by *Lactobacillus plantarum* WCFS1. *International journal of food microbiology*, 271, 15-23.
- Ruchi T, Sujata B, Anuradha D. (2015). Comparison of Phenotypic Methods for the Detection of Biofilm Production in Uro-Pathogens in a Tertiary Care Hospital in India. *International Journal of Current Microbiology and Applied Sciences*, 4(9): 840-849.
- Sahu, M. M., & Dwivedi, M. V. (2021). Studies on *Lactobacillus* bacteriocin for production and characterization against some pathogenic and food spoilage bacteria. *Journal Homepage*, 7(4).
- Shime-Hattori, A., Iida, T., Arita, M., Park, K., Kodama, T., & Honda, T. (2006). Two type IV pili of *Vibrio parahaemolyticus* play different roles in biofilm formation. *FEMS microbiology letters*, 264 1, 89-97 .
- Sunorita, M., dan Tjarsono, I. (2014). Kebijakan Hambatan Non Tarif Di Pasar Uni Eropa Terhadap Ekspor Komoditas Udang Indonesia. *Jurnal Transnasional*. 6(1), 43.
- Tan, L., Zhao, F., Han, Q., Zhao, A., Malakar, P., Liu, H., Pan, Y., & Zhao, Y. (2018). High Correlation Between Structure Development and Chemical Variation During Biofilm Formation by *Vibrio parahaemolyticus*. *Frontiers in Microbiology*, 9.
- Usman, N., Suradi, K., & Gumilar, J. (2018). Pengaruh Konsentrasi Bakteri Asam Laktat *Lactobacillus plantarum* dan *Lactobacillus casei* Terhadap Mutu Mikrobiologi dan Kimia Mayonnaise Probiotik. *Jurnal Ilmu Ternak Universitas Padjadjaran*, 18(2), 79-85.
- Utari, S. P. S. D., Samanta, P. N., Riviani, R., & Syafii, A. K. (2023). Mutu Ekspor Udang Vaname (*Litopenaeus vannamei*) Beku Bentuk PND (*Peeled Deveined*). *Jurnal Perikanan Unram*, 13(2), 599-612.
- Wang, D., Fletcher, G. C., On, S. L., Palmer, J. S., Gagic, D., & Flint, S. H. (2023). Biofilm formation, sodium hypochlorite susceptibility and genetic diversity of *Vibrio parahaemolyticus*. *International Journal of Food Microbiology*, 385, 110011.

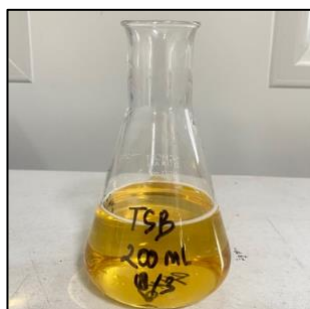
- Wang, D., Flint, S. H., Palmer, J. S., Gagic, D., Fletcher, G. C., & On, S. L. (2022). Global expansion of *Vibrio parahaemolyticus* threatens the seafood industry: Perspective on controlling its biofilm formation. *LWT*, *158*, 113182.
- Wang, D., Fletcher, G. C., Gagic, D., On, S. L., Palmer, J. S., & Flint, S. H. (2023). Comparative genome identification of accessory genes associated with strong biofilm formation in *Vibrio parahaemolyticus*. *Food Research International*, *166*, 112605.
- Wang, N., Yuan, L., Sadiq, F. A., & He, G. (2019). Inhibitory effect of *Lactobacillus plantarum* metabolites against biofilm formation by *Bacillus licheniformis* isolated from milk powder products. *Food Control*, *106*, 106721.
- Widiyastuti, E., Rusmana, I., & Yuhana, M. (2021). Skrining Dan Identifikasi Bakteri Anti Quorum Sensing Asal Tambak Udang Vaname Penghambat Virulensi *Vibrio parahaemolyticus*. *Jurnal Riset Akuakultur*, *16*(1), 61-69.
- Yahya, S. D., & Hasti, A. (2021). PKM Pengelolaan UMKM Otak-Otak Ikan Tenggiri Pelabuhan Paotere Kecamatan Ujung Tanah Makassar. *GLOBAL ABDIMAS: Jurnal Pengabdian Masyarakat*, *1*(2), 119-130.
- Yeor-Davidi, E., Zverzhinetsky, M., Krivitsky, V., & Patolsky, F. (2020). Real-time monitoring of bacterial biofilms metabolic activity by a redox-reactive nanosensors array. *Journal of Nanobiotechnology*, *18*, 1-11.
- Yin, Y., Ni, P., Liu, D., Yang, S., Almeida, A., Guo, Q., Zhang, Z., Deng, L., & Wang, D. (2019). Bacteriophage potential against *Vibrio parahaemolyticus* biofilms. *Food Control*.
- Zamani, H., Rahbar, S., Garakoui, S. R., Afsah Sahebi, A., & Jafari, H. (2017). Antibiofilm potential of *Lactobacillus plantarum* spp. cell free supernatant (CFS) against multidrug resistant bacterial pathogens. *Pharmaceutical and Biomedical Research*, *3*(2), 39-44.
- Zhang, L., Weng, Y., Wu, Y., Wang, X., Yin, Z., Yang, H., Yang, W., & Zhang, Y. (2018). H-NS is an activator of exopolysaccharide biosynthesis genes transcription in *Vibrio parahaemolyticus*. *Microbial pathogenesis*, *116*, 164-167.

**LAMPIRAN****Lampiran 1. Medium Pertumbuhan yang Digunakan pada Penelitian**

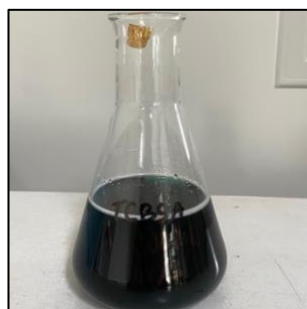
Media MRSB



Media MRSA



Media TSB

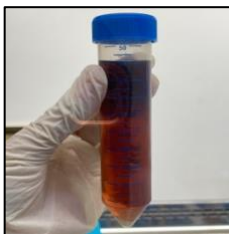


Media TCBSA

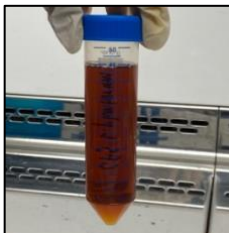
## Lampiran 2. Proses Pembuatan *Cell-Free Supernatant* (CFS) *L. plantarum*



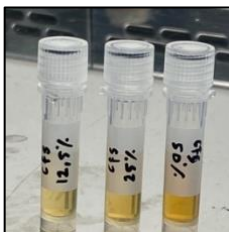
Kultur bakteri *L. plantarum* pada media MRSA



Kultur bakteri *L. plantarum* pada media MRSB yang telah diinkubasi selama 48 jam kemudian disterifugasi pada kecepatan 3000 rpm, 20 °C selama 15 menit



Hasil CFS yang telah disaring menggunakan filter 0,22 µm



Pembuatan tiga macam konsentrasi CFS (12,5%, 25%, dan 50% dengan penambahan media TSB)



CFS dihomogenkan menggunakan vortex

**Lampiran 3.** Dokumentasi kegiatan penelitian

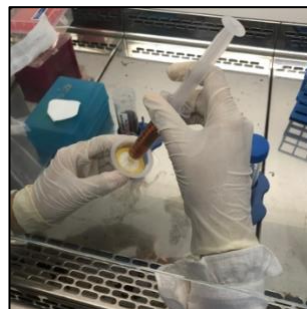
Peremajaan kultur bakteri *V. parahaemolyticus* pada media TCBSA



Pewarnaan Gram bakteri *V. parahaemolyticus* dan *L. plantarum*

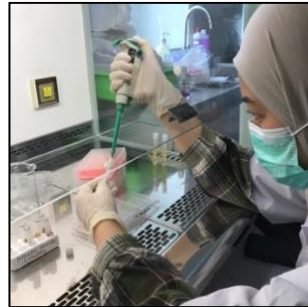
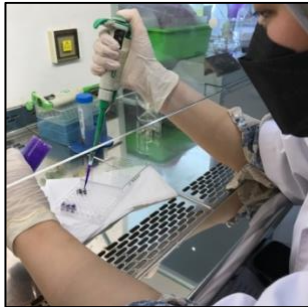


Pengukuran nilai OD bakteri *V. parahaemolyticus* menggunakan spektrofotometer





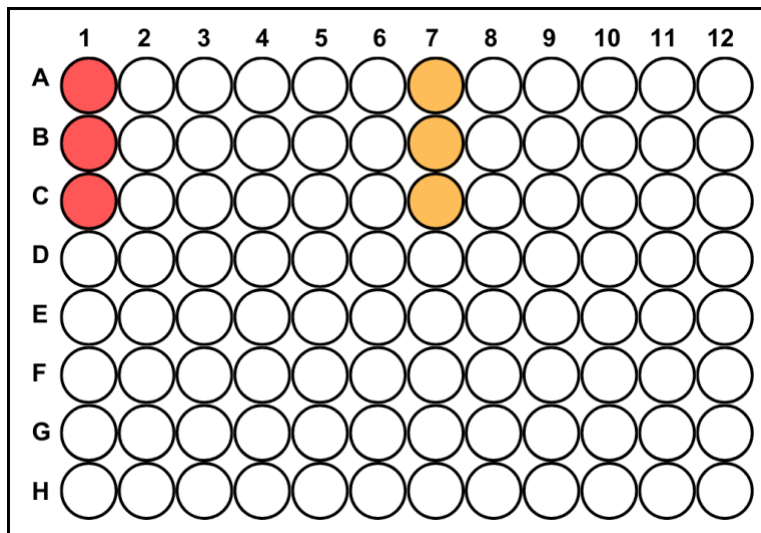
Pembuatan CFS *L. plantarum* dengan tiga jenis konsentrasi





Pengujian aktivitas antibiofilm CFS *L. plantarum* Terhadap *V. parahaemolyticus* pada *microplate* 96 wells

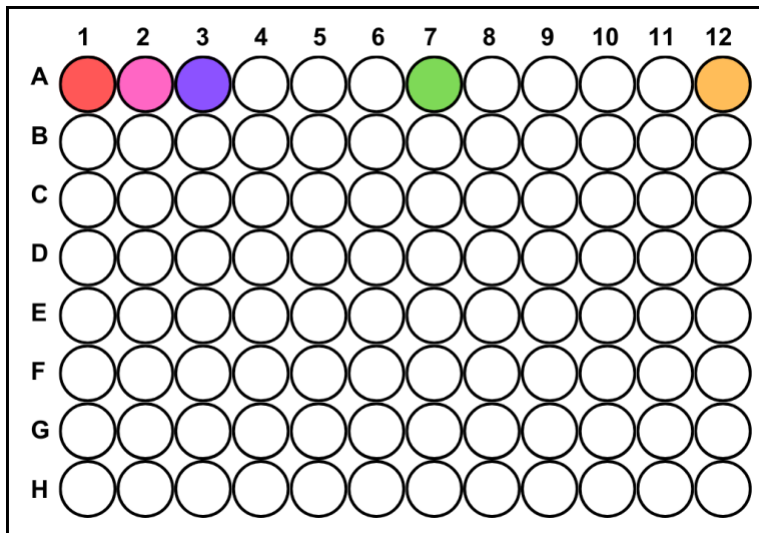


Perhitungan nilai OD untuk pengujian aktivitas antibiofilm menggunakan *microplate* reader






**Lampiran 4.** Gambaran Uji Deteksi Pembentukan Biofilm pada *Microplate***Gambaran Uji Deteksi Pembentukan Biofilm pada *Microplate***

Keterangan:

-  Kelompok uji suspensi *V. parahaemolyticus*
-  Kelompok kontrol media

**Lampiran 5.** Gambaran Uji Aktivitas Antibiofilm pada *Microplate***Gambaran Uji Pencegahan Penempelan Biofilm, Penghambatan Pembentukan Biofilm, dan Penghancuran Biofilm pada *Microplate***

Keterangan:

-  Kelompok uji CFS 12,5% pada *V. parahaemolyticus*
-  Kelompok uji CFS 25% pada *V. parahaemolyticus*
-  Kelompok uji CFS 50% pada *V. parahaemolyticus*
-  Kelompok kontrol negatif *V. parahaemolyticus*
-  Kelompok kontrol media

**Lampiran 6.** Hasil Uji Aktivitas Pencegahan Penempelan Biofilm pada *Microplate*

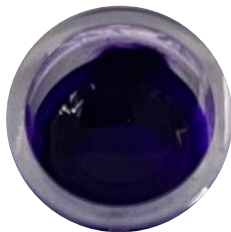
Konsentrasi CFS  
12,5% pada *Vibrio*  
*parahaemolyticus*



Konsentrasi CFS  
25% pada *Vibrio*  
*parahaemolyticus*



Konsentrasi CFS  
50% pada *Vibrio*  
*parahaemolyticus*

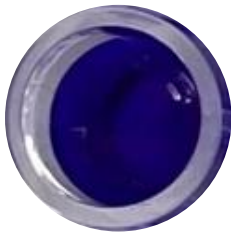


Kontrol negatif



Kontrol media

**Lampiran 7.** Hasil Uji Aktivitas Penghambatan Pembentukan Biofilm pada *Microplate*



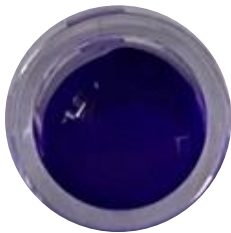
Konsentrasi CFS  
12,5% pada *Vibrio*  
*parahaemolyticus*



Konsentrasi CFS  
25% pada *Vibrio*  
*parahaemolyticus*



Konsentrasi CFS  
50% pada *Vibrio*  
*parahaemolyticus*



Kontrol negatif



Kontrol media

**Lampiran 8.** Hasil Uji Aktivitas Penghancuran Biofilm pada *Microplate*

Konsentrasi CFS  
12,5% pada *Vibrio*  
*parahaemolyticus*



Konsentrasi CFS  
25% pada *Vibrio*  
*parahaemolyticus*



Konsentrasi CFS  
50% pada *Vibrio*  
*parahaemolyticus*



Kontrol negatif



Kontrol media

## Lampiran 9. Data Hasil Uji Antibiofilm

### A. Uji Pencegahan Penempelan Biofilm

Kelompok Perlakuan	Nilai <i>Optical Density</i> (OD)	%Pencegahan
CFS 12,5%	0,6654	19,51%
CFS 25%	0,1765	78,65%
CFS 50%	0,1259	84,77%
Kontrol Negatif	0,8267	0%
Kontrol Media	0,1030	

### B. Uji Penghambatan Pembentukan Biofilm

Kelompok Perlakuan	Nilai <i>Optical Density</i> (OD)	%Penghambatan
CFS 12,5%	0,8667	3,93%
CFS 25%	0,4027	55,36%
CFS 50%	0,0828	90,82%
Kontrol Negatif	0,9022	0%
Kontrol Media	0,0822	

### C. Uji Penghancuran Biofilm

Kelompok Perlakuan	Nilai <i>Optical Density</i> (OD)	%Penghancuran
CFS 12,5%	0,1928	60,36%
CFS 25%	0,2653	45,46%
CFS 50%	0,4156	14,56%
Kontrol Negatif	0,4864	0%
Kontrol Media	0,1701	