PROGRAM BOOK

BICMST 2020

BRAWIJAYA INTERNATIONAL CONFERENCE ON MULTIDISCIPLINARY SCIENCES AND TECHNOLOGY

"Sustainable Future for Human and Natural Resources and Development"

2 - 3 January 2020
Universitas Brawijaya
Malang, Indonesia

Supported by:

FORWADEK II

ORAL SESSION SCHEDULE

Venue: FIB (B-BUILDING)

CLASS	ROOM	13:30 - 13:40	13:40 - 13:50	13:50 - 14:00	14:00 - 14:10	14:10 - 14:20	14:20 - 14:30	14:30 - 14:40	14:40 - 14:50	14:50 - 15:00	15:00 - 15:05	15:05 - 15:15	15:15 - 15:25	15:25 - 15:35	15:35 - 15:45	15:45 - 15:55	15:55 - 16:05	16:05 - 16:15
CE-1	FIB 1	CE-1119-060	CE-1127-099	CE-1129-149	CE-1127-133	CE-1127-136	CE-1127-101	CE-1129-142	CE-1129-144	CE-1129-148	COFFE BREAK	CE-1130-155	CE-1130-174	CE-1201-185	CE-1203-205	CE-1207-366	CE-1208-401	CE-1212-408
		Ade Rahmat Iskandar	Dwiyati SH	Novenda Prakusumaan	Asnilgimanti Surya Putra	Alifa Camilla Fadillah	Dwiyati SH	Anang Putri Ulfah	Alex Dian	Chandra Kurniawan Wiharja		Erti Susanti	Edi Purwaningtyas	Sultan Syah	Dwi Susanti	Erdhi Amalia	Bima Adi Prakosa	Anang Sujoko
CE-2	FIB 2	CE-1204-227	CE-1205-231	CE-1205-246	CE-1206-254	CE-1207-299	CE-1207-306	CE-1207-311	CE-1207-315	CE-1207-346		CE-1207-362	CE-1207-366	CE-1210-406	CE-1127-138	CE-1204-238	CE-1207-357	CE-1208-411
		Mariana Nurmalasari B	E. Sudiasari	Vita Mayarhaanul	Viola Hapsari	Eva Emaliana	E. Sudiasari	Lolita Permatasari	Rossi Maulidina Dolijar	Amanda Vira Maharani		Yora Valianti	Fransiska Dorlina Marten	Hamamah	Lalil Erika Rahmawati	Hamimah	Zulkarim Salampessy	Sahiruddin
CE-3	FIB 3	CE-1109-005	CE-1111-016	CE-1112-038	CE-1112-040	CE-1116-049	CE-1121-070	CE-1128-119	CE-1130-171	CE-1130-177		CE-1202-190	CE-1203-203	CE-1203-210	CE-1204-220	CE-1206-228	CE-1207-363	
		Iqlira Alkhwila	Sugeng Susilo Adi	Cristeta Monica Siftadi	Iqlimaturrahma Asmaa	Ketik Pratiwi	Dwi Ismawati	Lasty Arnawan	Nuyang Dakwidi	Nafi Siti Aisah		R Clarrisa Adiasmyra Leya	Rina Wulandari	Agus Ahiyanto	Angelina Anni Lamuri	Zainal Abidin	Dewi Andriani	
EG-1	FIB 4	EV-1111-014	EV-1115-03	EV-1119-059	EV-1126-092	EV-1207-301	EV-1126-097	EV-1128-122	EV-1130-160	EV-1130-170		GT-1207-322	GT-1203-234	EV-1206-251	GT-1206-297			
		Aulia Azman Maiti	R. Adhanya Udang	Intan Pradasary Ridhuan	Gita Sekar Prihanti	Rahmawati	Octara A. Pingsianasari	I Bagindo	Rachmadi Agus Triono	Lulu Nurlia		Harky Dwi Yusuf Mustafa	Arya Mahendra Sakti	Sunkung Dunne	Muhamad Awaill			
EG-2	FIB 5	EV-1203-207	EV-1204-221	EV-1204-222	EV-1206-276	EV-1206-277	EV-1207-310	EV-1207-324	EV-1207-332	EV-1203-208		GT-1207-337	EV-1103-003	EV-1128-120	EV-1202-200			
		Layta Danna	Yolanda Naraia Pradana	Shofiana Istiqomah	Dita Rifka Annisaa	Wahyu Budi Pratiwi	Sandra Ayu P. Gunawan	Fransiscus Desbardi Wasumiditya	Tirzafira Febriani Adindah	Arista Y. P. Wardaya		Gloria Defanya Silampu	Eka Pratiwi Triwisworo	Ayu Pramita	Anto Tri Sugiarto			
EG-3	FIB 6	EV-1115-043	EV-1115-044	EV-1121-072	EV-1121-078	EV-1125-089	EV-1125-090	GT-1209-260	GT-1209-261	EV-1207-340		EV-1207-331	EV-1204-209	GT-1207-378				
		Estina Kusmintagtyas	Dodi Setiawan	Jamal Rifatapa	Rahaina Rakot	Karta Rasyada	Karta Rasyada	Budiman	Fausi Muzadi	Rayinta Aji Kamaladewi		Cresentia Liony Prastica Mallisa	Febriananwati Yusup	Anna Ansri				
LSP-1	FIB 7	LW-1115-037	SP-1115-034	SP-1123-080	SP-1125-086	SP-1128-125	SP-1130-167	SP-1204-269	SP-1130-169	SP-1121-068		SP-1128-124	SP-1128-127	SP-1128-129	SP-1204-224	SP-1207-383		
		Muhammad Yusuf Al Izhar	Fathur Rahman	Muchlis Al-Fikri	Sehnik Harta Anugrah	Hani Kamla	Sri Sumarni	Bundir	Kasmuri Thahir	Sumarto Pelangan		Ali Mustofa	E.D. Permatasari	Suryono	Ramanesa Saragih	Arjun Fatahillah		
LSP-2	FIB 8	SP-1130-178	SP-1203-212	SP-1204-215	SP-1206-263	SP-1206-284	SP-1206-285	SP-1207-307	SP-1207-326	SP-1130-172		SP-1130-170	SP-1205-249	SP-1205-250	SP-1204-216			
		Sahiruddin	Dwi Yan Nugraha	Chairul Muchson Syaikhah	Santi Nurfitriah	Eka Kurniawan Putra	Nurlila Febriany	Tiana I.W. Primadani	Ishaq Yusuf	Tukyo Muhammad Ali		Prio Taufiq Ridwan	Tatang Sudrajat	Tatang Sudrajat	Anang Sujoko			
LSP-3	FIB 9	LW-1113-020	LW-1115-041	LW-1119-061	LW-1121-074	LW-1201-192	LW-1206-265	SP-1115-052	SP-1115-050	SP-1115-039		SP-1115-042	SP-1207-399	SP-1206-260	SP-1207-385			
		Widya Kurniawan	Agung Imam Zulkarna	Taufiqurrahman	Aulia Rosa Nasution	Nurwidya Kusuma Wardhani	Dijan Widjowati	Retno Damayanti	Wiwik Indri Astuti	Agung Imam Zulkarna		Agung Imam Zulkarna	Ike Anjani F. Santoso	Ali Anas	Herlina Dwi Wulandari			
LSP-4	FIB 10	SP-1110-057	SP-1110-058	SP-1121-069	SP-1129-141	SP-1129-146	SP-1130-159	SP-1206-202	SP-1207-394	SP-1207-312		SP-1207-317	SP-1207-321	SP-1207-345	SP-1207-388			
		Dina Hinanie	Asmin Ariyanto Azis	Muhammad Rafiri Nanda Lubis	Saharuddin	Karta Rasyada	St. Junaiati	Evi Fadhilah Putri	Enny Anita	Wildan Syafitri		Rachma Kusumaputri	Maryanti	Katarina Ditasari W A	Siti Fadhilah Putri			

EV-1111-014 ROOM: FIB-4 13:30 - 13:40

Effectiveness of Organic Waste Bioconversion Design in Household Scale Using Black Soldier Fly Larva (*Hermetia illucens*)

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Abstract - Waste in Indonesia is dominated by organic waste. One of the main sources of organic waste producers is households. Household organic waste processing can be done by composting. However, the benefits gained from processing waste by composting are few. Efforts to increase the economic value of organic waste are by utilizing Black Soldier Flies (BSF) or *Hermetia illucens* as decomposers of organic waste. This research studied the effectiveness of two household scale organic waste bioconversion tool designs using Black Soldier Flies (BSF) larvae in a mixture of rice and cassava leaves (1: 1). Each design has two parts, namely the egg incubator and larval rearing. The larval rearing place in design A has a base area of 1,160 cm^2 with a height of 11.5 cm while the larval rearing place in design B has a 552 cm2 base area with a height of 6.5 cm. Larvae enlargement site design A has an area of 3,368 cm^2 and larvae enlargement design B has a base area of 2,557 cm^2. Each larval enlargement design has the same height of 39.5 cm. The eggs used in each design are 0.35 grams. The study was conducted for 20 days, by analyzing larvae weight, substrate consumption, and waste reduction index. The results of this study indicate that the average weight of larvae in design A was 0.132 grams and the average weight of larvae in design B was 0.121 grams. The percentage of substrate consumption in design A was 61.54% while in design B it was 58.97%. Waste reduction index in design A was 4.73% while in design B it was 4.54%.

Keywords: BSF; *Hermetia illucens*, Bioconversion; Organic waste.

EV-1115-031 ROOM: FIB-4 13:40 - 13:50

Indigenous Bacteria as Bioremidiation Agent of Sugar Organic Industrial Waste Water

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Abstract - Wastewater is the remainder of a business or activity that is disposed of in liquid form. The wastewater produced is feared to have a negative influence on the environmental balance, therefore it is necessary to know the quality standards of wastewater as a reference in the disposal and treatment of wastewater. Bioremediation is an environmentally friendly technology that utilizes microorganisms as agents in the process of cleaning or restoring wastewater conditions. The use of microorganism services can reduce the concentration of organic waste into simple organic compounds, by converting organic compounds into CO_2, CH_4, H_2, and H_2S, as well as water and energy intended for the process of growth and production of microorganisms in the remediation process. This study aims to identify the type of microorganism as the dominant bacteria grown in the wastewater of the sugar industry, it can be tested as a bioremediation agent for the waste. This research was conducted at the Laboratory of Aquatic Environment and Biotechnology, Faculty of Fisheries and Marine Sciences. Identification of bacteria was carried out in the Laboratory of Microbiology, Faculty of Medicine, Brawijaya University. The method used in this study is the experimental method, by observing several environmental parameters as indicators of the success of the remediation process, among others, BOD, COD, TSS, and pH. The results show two types of dominant bacteria namely *Staphylococcus aureus*, and *Bacillus subtilis*, then used as bioremediation agents. The bioremediation activity was able to reduce BOD and COD levels, where BOD value before remediation was 4.73 mg/L and decreased to 2.89 mg/L. The value of COD has decreased from 56 mg/L to 50 mg/L. The TSS value is 20.5 mg/L to 20.4 mg/L, the pH value shows a significant result where the bioremediation process is able to increase the pH value from 4.8 to 7.

Keywords: Wastewater; Bioremediation; *Staphylococcus aureus*; *Bacillus subtilis*.

EV-1119-059 ROOM: FIB-4 13:50 – 14:00

Dynamic Vista of Sustainable Green Public Spaces Network in Wonosobo

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Abstract - Regional development always stimulates urbanization which attracts people to come to the city. Demographic grows and generates needs of space for dwelling. Unfortunately, new houses are built on the sites which are the green pockets amidst in settlement. The new house plan is worsened by the absence of green space

area within to maintain ecosystem balance. This phenomenon begins to be seen in Wonosobo Regency, Indonesia, especially in Kampung Sruni. The challenge of creating green space in the middle of built settlement is the availability of land which is many in quantity, relatively small in size, but scattered. On the other hand, this kampung has been planned as one of the urban tourism destinations in Wonosobo, promoting people and cultural performance staged on the panoramic background setting of the green valley landscape. Strategy to replenish the degrading green spaces in this kampung and to make it sustainable was done by designing it for both inhabitants, environment and tourism. Nine green public space designs are proposed to this kampung. Interestingly, beside its function as green space and making network, the spatial component arrangement of the designs created different types of vista offering view the landscape of man-made, man-made and nature, and fully nature. Moreover, by the movements through these green public spaces, observers would get spatial experience visually for their eyes and motorically for the body. Thus, these designs of public space are created as representations of the community engaged with their culture and urban landscape fabric of Wonosobo.

Keywords: Green public space; network; vista; Wonosobo; tourism.

EV-1126-092 **ROOM: FIB-4** **14:00 - 14:10**

The Effect of Environmental Factors on The Event of Acute Diarrhea

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Abstract - Background: Diarrhea is an environment-based disease that is endemic in Indonesia with a high prevalence rate. One of the main causes of diarrhea is microbiological contamination that can be transmitted through underground water to dug wells. E. Coli is a common bacterium that is a plague of diarrheal diseases caused by dug well water. **Objective**: Knowing the influence of environmental factors, namely microbiology of water, clean water facilities (CWF), toilet facilities and sewerage facilities (SF) and the availability of trash bins against the incidence of acute diarrhea. **Method**: A cross sectional observational analytic study with a total of 228 users of dug wells and 38 dug wells that met the inclusion criteria in the City Health Center Working Area in the Northern Region of Kota Kediri with dug wells used for drinking and bathing which were permitted to be examined. Data was taken using questionnaires and checklists for variables SAB, latrine, SPAL and availability of trash bins also laboratory results from the Kediri labkesda for water microbiology. The data obtained were analyzed by Chi square test and Linear Regression. **Result**: The bivariate test results showed water microbiological factors p = 0,000, SAB p = 0,000, toilet facilities p = 0,001 and SPAL p = 0,005 which significantly affected the incidence of diarrhea. The multivariate test results showed that water microbiological factors had the most significant effect on the incidence of diarrhea (p = 0,000; OR: 4,67; 95% CI: 2,51 - 8,7). **Conclusion**: The need for counseling interventions as well as improving the quality of well water and CWF by improving well construction, checking well water regularly and cooking well water before consumption. The need to form a closed, permanent and non-stagnant SF and the construction of clean toilets, non-soil floors and a distance of septic tanks > 10m from CWF. **Take Home Message**: There exist a need to be educated about the importance of clean water, latrines and wastewater disposal that meets the requirements in preventing acute diarrhea

Keyword: Water microbiology, dug wells, diarrhea, clean water facilities, latrines, wastewater disposal facilities, trash can

EV-1207-381 **ROOM: FIB-4** **14:10 - 14:20**

Photocatalytic Performance of CdS/(Pt-TiO_2)-Pumice for *E. coli* Disinfection in Drinking Water

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Abstract - Photocatalytic removal of *E. coli* pathogen bacteria existing in drinking water was studied in this paper. CdS/Pt-TiO_2 nanocomposite was synthesized by depositing Pt/CdS on TiO_2 nanoparticles with chemical reduction and hydrothermal method. On the other hand, CdS/(Pt-TiO_2)-Pumice was fabricated by immobilizing of titania composite onto pumice with dip coating method in order to gain the photocatalytic process without problem in the separation of titania from solution. The Field Emission Electron Microscopy (FESEM), Transmission Electron Microscopy (TEM), UV-Vis Diffuse Reflectance Spectroscopy (UV-Vis DRS) were utilized to characterize the photocatalyst samples. Based on the morphology characterization, it was observed that successful deposition of Pt and CdS on TiO_2 occurred. Furthermore, decorating Pt/CdS on TiO_2 can reduce bandgap energy compare to the bare TiO_2 according to the UV-Vis DRS analysis. The treatment of *E. coli* inactivation with CdS/(Pt-TiO_2), CdS/(Pt-TiO_2)-pumice and without photocatalyst had performed in the photoreactor that irradiated with mostly visible light in 90 minutes. The amount and the contact mechanism between the photocatalyst and bacteria in the water would affects the efficiency of *E-coli* photocatalytic disinfection in drinking water.

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CERTIFICATE

FORWADEK II

Awarded to

Intan Findanavy Ridzqo, ST, M. Ars.

as

Presenter

in recognition of his/her participation of

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