WET2017

Water and Environment Technology Conference 2017

22-23 July 2017

Hokkaido University Conference Hall
Sapporo campus
Hokkaido University
Sapporo Japan

PROGRAM and ABSTRACTS

Organized by

Japan Society on Water Environment

Japan National Young Water Professionals

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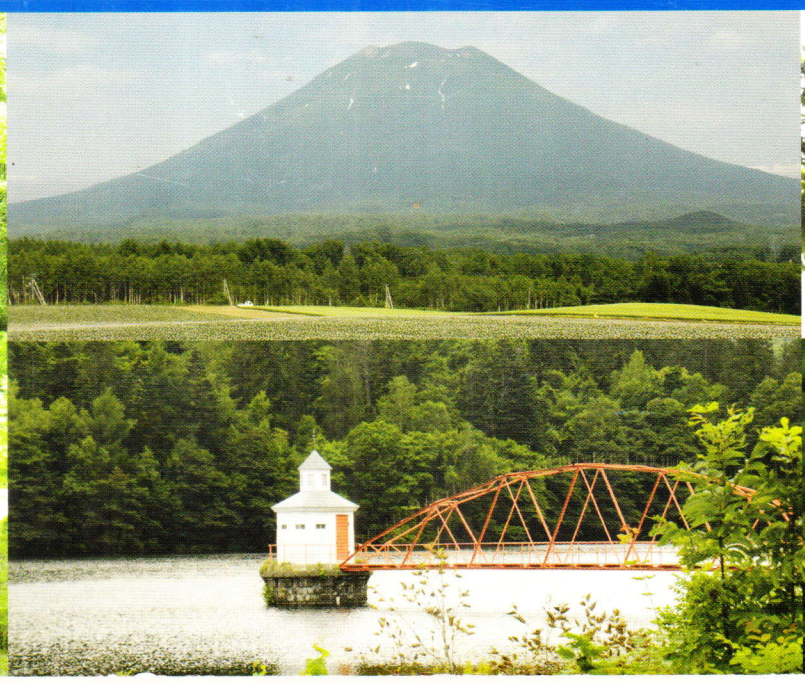

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WET2017 Program and Abstract

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ll presenters are asked to introduce your posters in oral introduction session prior to the poster viewing essions.

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a) Prepare your presentation slides with Microsoft Powerpoint.
Laptop Windows PCs equipped with Office 2016 are prepared in the presentation rooms.
Macintosh PC is not available.

b) Bring your presentation file by **USB flash memory**.
We strongly recommend you bring your file in more than one USB flash memories just in case.

c) The file name should be your presentation number and your name.
For example, if my name is "WATANABE" and my presentation number is 1A-22, then the file name must be "1A-22 WATANABE".

d) Strictly keep presentation time shorter than 4 (four) minutes.
Session chair may interrupt your presentation when 4 min passed.

e) All the questions and discussion should be made at the poster viewing session.
No time for questions and discussion in the oral presentation.

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a) Size of the poster board is 176 cm height and 86 cm width.
Prepare your poster to fit in the poster board.

b) Push pins are available at the poster session floor.

c) Put/remove your poster according to the following schedule;

For presenters on 22nd July (1st day)

Stick up your poster by 14:00 on July 22nd.

Please DO NOT remove your poster before the second session ends (19:00 on July 22nd).

Please remove your poster by 20:00 on July 22nd.

For presenters on 23rd July (2nd day)

Stick up your poster after 20:00 on July 22nd

or by between 8:00~ 8:30 on July 23rd.

Please DO NOT remove your poster before the second session ends (13:30 on July 23rd).

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Note that remaining poster after the designated time will be removed and disposed by WET2017 staffs

Full paper Submission Due (Extended)

If those who wish to submit full paper on WET2017, the submission due is July 30, 2017.

We strongly encourage you to submit your presentation as a full paper.

WET2017 Conference Program at a Glance

Date	Time slot	Session	Room A	Room B	Hall
Sat. 22 July.	9:30	**Registration desk open**			
	10:00-12:00	S01	**Japan-YWP 6th International Symposium**	-	
	12:00-13:00				
	13:00-13:50	S02	**Opening Ceremony**		
	14:00-15:30	S1	**Oral introduction 1A**	**Oral introduction 1B**	
	15:30-16:30		-	-	**Poster viewing 1A, 1B**
	16:30-18:00	S2	**Oral introduction 2A**	**Oral introduction 2B**	
	18:00-19:00		-	-	**Poster viewing 2A, 2B**
	19:00-20:30			**Conference Dinner** (complimentary)	
Date	**Time slot**	**Session**	**Room A**	**Room B**	**Hall**
Sun. 23 July.	8:30-10:00	S3	**Oral introduction 3A**	**Oral introduction 3B**	
	10:00-11:00		-	-	**Poster viewing 3A, 3B**
	11:00-12:30	S4	**Oral introduction 4A**	**Oral introduction 4B**	
	12:30-13:30		-	-	**Poster viewing 4A, 4B**
	13:30-14:20			**Farewell Lunch** (complimentary)	
	14:30-	S03	**Closing Ceremony**		

WET2017 Technical Program

Session	Speaker	Title	Page
Saturday, July 22nd Session 1A			***Chair: KUBOTA, Kengo***
		Oral presentation: 14:00-15:30, Poster viewing: 15:30-16:30, Put up poster by 14:00, Saturday, July 22nd	
1A-01	HU, Yong (00014616)	Comparative Performance of Mesophilic and Thermophilic Self-agitated Anaerobic Reactors for Food Waste Treatment	1
1A-02	Changed to 3B-0		
1A-03	FURUSAWA, Shun (00014903)	Life Cycle Risk Assessment (LCRA) for Fish Species in Urban River	1
1A-04	SATO, Shin (00014904)	The Effect of Cuounter-Flow on Electro-De-Ionization Apparatus	2
1A-05	WU, Chia-Yu (00014905)	Removal of Mercury in Various Matrices Using Forward Osmosis Process	2
1A-06	RATTANAKUL, Surapong (00014906)	Protocol Development for the Detection of Human Adenovirus Serotype 5 in Wastewater with Infectivity Assay	3
1A-07	TAROEPRATJEKA, Dyah Asri Handayani (00014907)	Kinetics of Aerobic Sequencing Batch Reactor after Dissolved Air Flotation for Slaughterhouse Wastewater Treatment in Bandung, Indonesia	3
1A-08	AKAI, Shotaro (00014912)	Effects of High Concentrations of Phenol on the Growth of Salt-Tolerant Chlorella sp.	4
1A-09	REDDY, Motakatla Venkateswar (00014913)	Production of Medium Chain Fatty Acids (MCFA) Using Acetate and Mixed Culture	4
1A-10	KONNO, Hiroki (00014914)	Facile Synthesis of Metal Organic Frameworks Immobilized on Microfibril for Wastewater Purification	5
1A-11	IBRAHIM, Imran Halimi (00014915)	CFD Analysis of Various Back Drop Designs	5
1A-12	TSUSHIMA, Ikuo (00014917)	Effects on Algal Growth by Adding Silver Nanoparticles in Size-fractionated Wastewater	6
1A-13	SEYAM, Mohammed (00014919)	Evaluation of Over Abstraction Influence on Groundwater Salinity Using Artificial Neural Networks	6
1A-14	KAWANA, Takahiro (00014920)	An Effect and Behavior of the Vacuum Ultraviolet (VUV) Irradiated Water on the Prevention against Paddy Rice Seed Disease (*Gibberella fujikuroi*)	7
1A-15	SUN, Xiaohang (00014921)	Biodegradation of Poly-3-hydroxybutyrate and Production of (R)-3-hydroxybutyric acid	7
1A-16	YAMAOKA, Yuuki (00014923)	Microfiltration Behaviors of Colloid of Dual-Sized Submicron Particles through Semi-Permeable Membrane	8
1A-17	MASUDA, Haruki (00014924)	Evaluation of Flux Decline Behaviors in Variable-Pressure Dead-End Ultrafiltration Controlled by Cake Formation of Nanocolloids	8
1A-18	MIZUNO, Yuki (00014925)	Membrane Type Wastewater Decolorization Using Culture Supernatant of Trametes versicolor and Squeezing of Physiologically Active Substance from Fungus Body	9
1A-19	SAWANGJANG, Benyapa (00014958)	Comparing Fluoride Adsorption Capacity onto Different Types of Bone Char	9
1A-20	AMANO, Mitsuru (00014989)	Removal of Haloacetic Acid Precursors by Filtration Using Metal-Coated Filter Media.	10
1A-21	NGUYEN, Mai Kim Diem (00015030)	Application of Taguchi Method in the Investigation of the Carbon Dioxide Removal Process Using Water Absorption Innovated with the Water-Film-Forming-Unit	10

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1B-02	HARIBOWO, Riyanto (00014926)	Effectivity Test of Eco-Friendly Sediment Trap Model as a Strategy to Control Erosion on Agricultural Land	11
1B-03	TAKAARA, Tomoko (00014927)	Characterizations of Radioactive Materials Removal in Water Purification Plant	12
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1B-19	Sulfikar (00014952)	Effects of Sedimentation and Aeration on Antibiotic Resistance Induction in an Activated Sludge Process	20
1B-20	CHEN, Xi (00014954)	Renovation of Disposed Reverse Osmosis (RO) Membrane by Copper Nanoparticles Coating to Fouling-resisted Membrane.	20
1B-21	SASAKI, Haruna (00014955)	Effects of Fatty Acid Salts against Trophozoites and Cysts of the Amoeba	21

1A-06

Protocol Development for the Detection of Human Adenovirus Serotype 5 in Wastewater with Infectivity Assay

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Plaque assay, a technique that can evaluate the infectivity of enteric viruses such as human Adenoviruses (HAdVs), is commonly used to investigate the effectiveness of drinking water treatment processes. However, the assay is hardly applied to wastewater due to cytotoxic effects to the host cells. Based on this background, a minimum dilution factor of wastewater was determined to be non-cytotoxic for the HAdV5 host cell, A549 cell line. Namely, cytotoxicity to A549 was tested with different dilution factors of wastewater in which the cell conditions and viability were observed. Cell viability and conditions in wastewater samples at different dilutions ranging from 1:1.5 to 1:4, in the ratio of wastewater to a mixture of wastewater and culture media, were found to be not different with those in culture media. Finding suggests that wastewater should be diluted at least with a dilution factor of 1:1.5 before performing plaque assays. Subsequently, the developed plaque assay was applied to assess the UV inactivation efficiency of HAdV5 in wastewater after UV treatment compared with that in dechlorinated drinking water. At the same fluence, a $\log_{10}$ inactivation of HAdV5 in wastewater was significantly higher than in dechlorinated drinking water implying that constituents in wastewater assisted virus inactivation.

1A-07

Kinetics of Aerobic Sequencing Batch Reactor after Dissolved Air Flotation for Slaughterhouse Wastewater Treatment in Bandung, Indonesia

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Slaughterhouse produces wastewater with high organic matters which includes blood, fat, proteins, and solids. The wastewater from Ciroyom Slaughterhouse in Bandung Indonesia has the average COD of 3118.95 mg/L, suitable for aerobic process. Dissolved Air Flotation was used as a pre-treatment to eliminate the high contents of oils and fats in slaughterhouse wastewater. This research was conducted to study the kinetics of low (1500 mg/L COD) and high (3500 mg/L COD) organic loading adjustments and 2 variations of reaction to stabilization time (4 h reaction to 4 h stabilization and 2 h reaction to 6 h stabilization). The lab scale aerobic SBR was operated in 3 continuous cycles of 12 hours each. The entire cycle consists of fill (1 hour), react (4 or 2 hours), settle & decant (3 hours), and stabilization/idle (4 or 6 hours). The kinetic parameters of Y (growth yield coefficient), q (specific substrate uptake rate), and μ (specific growth rate) were compared between those four conditions. The best cycle kinetics for organic carbon removal was achieved in 3500 mg/L COD with 2 h reaction to 6 h stabilization time with Y, q, and μ of 0.3638 mg VSS/mg COD, 0.0255 h^{-1}, and 0.007 h^{-1}, respectively.

Kinetics of Aerobic Sequencing Batch Reactor after Dissolved Air Flotation for Slaughterhouse Wastewater Treatment in Bandung, Indonesia

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1. Introduction

Ciroyom Slaughterhouse Wastewater Characteristics

No.	Parameter		
1.	Nitrite – N (NO_2)	mg/l	1.609
2.	Nitrate – N (NO_3)	mg/l	2.663
3.	Ammonium – N (NH_4)	mg/l	47.833
4.	Total Suspended Solid	mg/l	152
5.	Total Dissolved Solid	mg/l	15,330
6.	Total Solid	mg/l	15,555
7.	Nitrogen Kjeldahl (NTK)	mg/l	306.3
8.	Total COD	mg/l	3,118.95
9.	Dissolved COD	mg/l	3,013.23
10.	Total P	mg/l	52.43
11.	BOD_5	mg/l	1,712.84

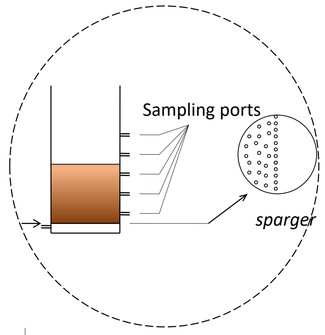
Exceeds the Indonesian Government standard for COD in slaughterhouse wastewater (200 mg/L), so treatment is needed.

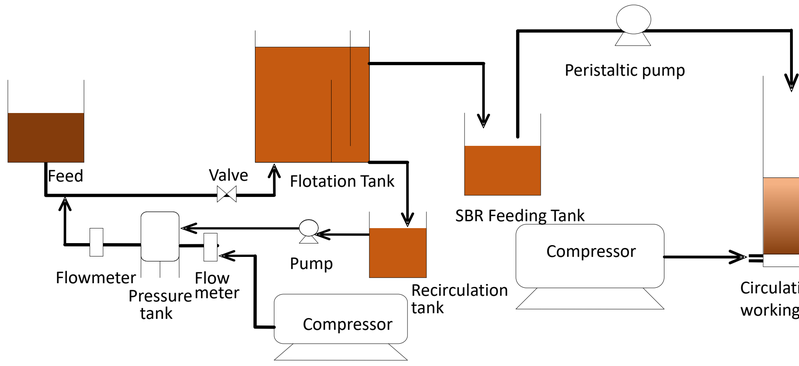
Sequencing Batch Reactor (SBR):
Has relatively simple installation design, intermittent time of operation → suitable for the condition of slaughterhouse, with 13 hours of working time per day.

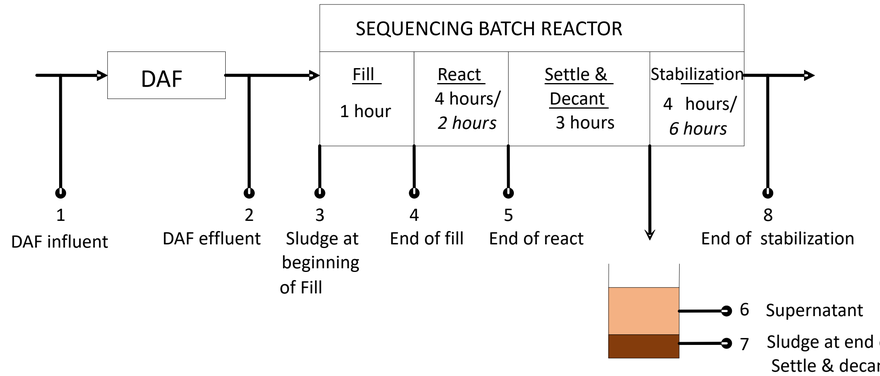
Objectives:
to study the effects of low load (1,500 mg/L COD) and high load (3,500 mg/L COD) organic loadings and reaction to stabilization time to Sequencing Batch Reactor efficiencies and kinetics.

2. Material and Methods

	1500 mg/L COD load	3500 mg/L COD load
4 h react & 4 h stabilization time	O	O
2 h react & 6 h stabilization time	X	O



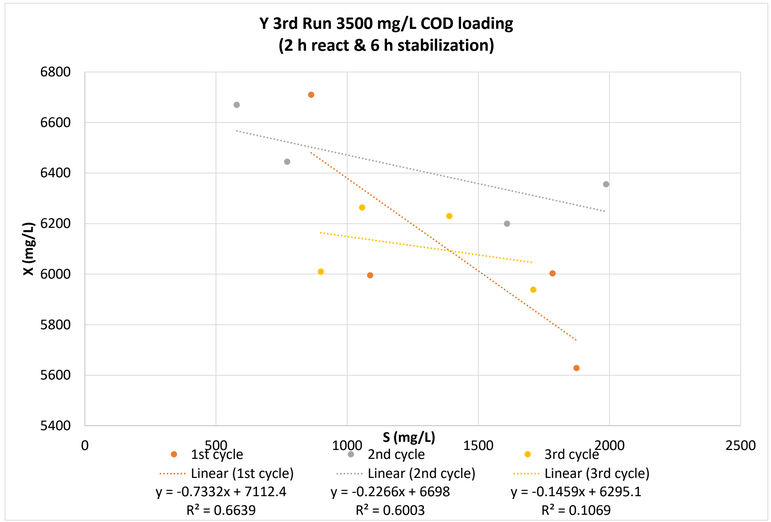


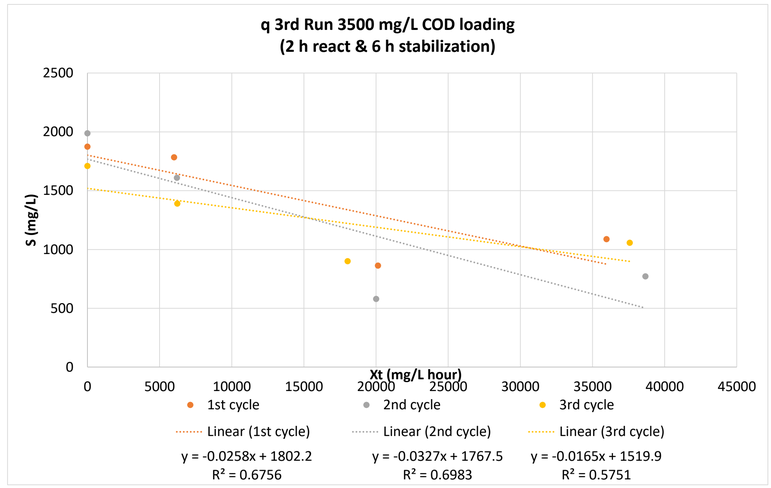


3. Results

Organic Carbon Removal Efficiency

	1500 mg/L COD Loading		3500 mg/L COD Loading		
Cycle	1st run	2nd run	1st run	2nd run	3rd run
	4 h react, 4 h stabilization	4 h react, 4 h stabilization	4 h react, 4 h stabilization	4 h react, 4 h stabilization	2 h react, 6 h stabilization
1	52.86%	89.22%	84.54%	86.36%	71.19%
2	72.46%	81.63%	89.76%	90.82%	80.88%
3	84.46%	79.83%	85.48%	94.20%	68.17%
average	69.93%	83.56%	86.59%	90.46%	73.41%

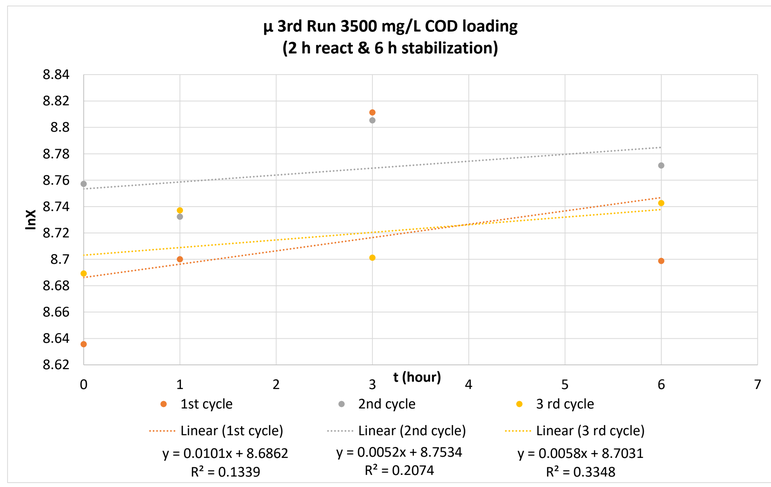




Kinetics Results

Run	COD Loading	Cycle	Y (mg VSS/ mg COD)	q (hour^{-1})	μ (hour^{-1})
2 (4 h react, 4 h stabilization)	1500	1	0.3243	0.0122	0.0031
		2	-0.021	0.0123	-0.0084
		3	-0.8449	0.0102	-0.0097
		average	-0.1805	0.0116	-0.0050
	3500	1	0.1612	0.0181	0.0049
		2	-0.4108	0.0174	-0.0146
		3	0.4489	0.0205	0.0154
		average	0.0664	0.0187	0.0019
3 (2 h react, 6 h stabilization)	3500	1	0.7332	0.0258	0.0101
		2	0.2122	0.0327	0.0052
		3	0.1459	0.0165	0.0058
		average	0.3638	0.025	0.0070

Negative Y value might be caused by insufficient substrate and oxygen during the settle & decant period, because the reactor was not aerated during that period.



4. Conclusion

- Best efficiency for organic C removal was 90.46% at 3500 mg/L COD loading and 4 hours react and 4 hours stabilization time.
- Highest overall cycle kinetics for carbon removal was achieved at 3500 mg/L COD loading with 2 hours react and 6 hours stabilization time with Y, q, and μ of 0.3638 mg VSS/ mg COD, 0.025 hour^{-1}, and 0.007 hours^{-1}, respectively.