WET2018

Water and Environment Technology Conference 2018

14-15 July 2018

Lecture Hall A,
Johoku Campus of Ehime University
Matsuyama, Ehime, Japan

PROGRAM and ABSTRACTS

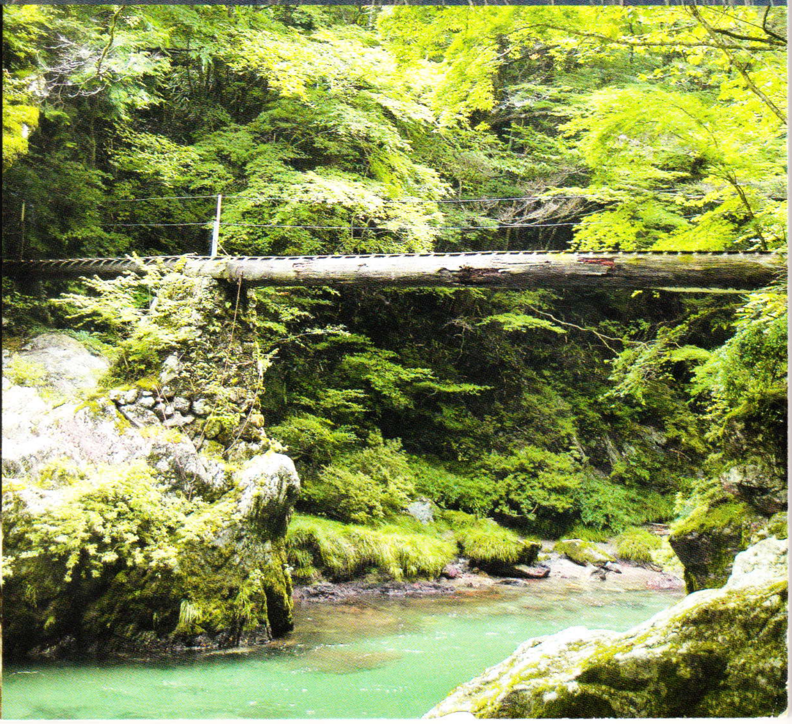
Organized by

Japan Society on Water Environment

Japan YWP | Japan National Young Water Professionals

Sponsored by

水ing Swing Corporation



WET2018 Committees

WET2018 Program and Abstract

Issued on 14th July 2018

Japan Society on Water Environment	Green Plaza Fukagawatokiwa 201 2-9-7 Tokiwa Koto 135-0006 Tokyo, Japan +81-3-3632-5351
Taiyo Bijutsu (Printing office)	2-7-11 Kiyosumi Koto 135-0024 Tokyo, Japan +81-3-3642-6045

;TRUCTION FOR PRESENTERS

presenters are required to put up their posters before the oral presentation. Confirm your presentation nber and the session time in the attached program. Please carefully read the following instructions l prepare your presentation accordingly.

ORAL INTRODUCTION PRESENTATION

a) Prepare your presentation slides using Microsoft Powerpoint. Laptop Windows PCs equipped with Office 2013 are prepared in the presentation rooms. Macintosh PC's are not available.

b) Bring your USB flash memory file for the presentation, if needed. We strongly recommend that you bring your file in more than one USB flash memories just in case.

c) Your family name and presentation should be your presentation's file name. For example, if your family name is "WATANABE" and your presentation number is 1A-22, the file name should be "1A-22watanabe".

d) Strictly keep presentation time shorter than FOUR minutes. Session chair may interrupt your presentation if it's time.

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

f) Install your presentation files to the PC in the session room at an earlier time, or 10 minutes before your session starts.

If you need assistance, please ask WET2018 staff in the session room.

POSTER VIEWING SESSION

a) Size of the poster board is 200 cm height and 120 cm width. Please make sure your poster fits in the poster board.

b) Tapes are available at the poster session rooms. Pushpins cannot be used (hard boards).

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

For presenters on July 14th (1st day)

Put up your poster by 14:00 on July 14th.

Please DO NOT remove your poster before the second session ends (18:20) on July 14th.

Please remove your poster by 20:45 on July 14th or between 7:50~8:00 on July 15th.

For presenters on July 15th (2nd day)

Put up your poster after the second poster session ends (18:20 on July 14th) or between 8:00~ 8:30 on July 15th.

Please DO NOT remove your poster before the second session ends (13:10 on July 15th).

Please remove your poster by 15:15 on July 15th.

Note that remaining posters after the designated time will be disposed by WET2018 staff.

WET2018 Conference Program at a Glance

Date	Time	Session	Room (Lecture Hall A)									Cafeteria (Seikyo)
			A(1F)	B(2F)	C(2F)	D(2F)	E(2F)	F(3F)	G(3F)	H(3F)	J(3F)	
Sat. 14 July	10:00-12:00			Japan-YWP International Symposium								
	12:00-12:40		Registration and Lunch break									
	12:40-13:40		Opening Ceremony									
	13:40-14:50	1A/1B/1C	Oral 1A	Oral 1B	Oral 1C							
	14:50-16:00					Poster 1A	Poster 1A	Poster 1B	Poster 1B	Poster 1C	Poster 1C	
	16:00-17:10	2A/2B/2C	Oral 2A	Oral 2B	Oral 2C							
	17:10-18:20					Poster 2A	Poster 2A	Poster 2B	Poster 2B	Poster 2C	Poster 2C	
	18:30-20:30											Conference Dinner (complimentary)
Sun. 15 July	8:30-9:40	3A/3B/3C	Oral 3A	Oral 3B	Oral 3C							
	9:40-10:50					Poster 3A	Poster 3A	Poster 3B	Poster 3B	Poster 3C	Poster 3C	
	10:50-12:00	4A/4B/4C	Oral 4A	Oral 4B	Oral 4C							
	12:00-13:10					Poster 4A	Poster 4A	Poster 4B	Poster 4B	Poster 4C	Poster 4C	
	13:20-14:00											Farewell Lunch (complimentary)
	14:10-15:00		Closing Ceremony									

Session 3C Sunday, July 15th Chair: TAKABE, Yugo

Oral presentation: 8:30-9:40, Poster viewing: 9:40-10:50, Put up poster by 8:30 Sunday, July 15th

	Speaker	Title	Page
3C-01	SAJALI, Muhammad Amar (00017248)	Study of Self-purification of Brantas River due to Disposal of Animal Slaughter Facilities	68
3C-02	SAYEKTI, Rini Wahyu (00017250)	Study of Most Influential Communal Wastewater Treatment Plant on Water Quality of Metro River in Malang City	68
3C-03	HUANG, Ying Hsuan (00017340)	Enhancement of Manganese Ion on the Formation of Iodo-organic Compounds during Disinfection	69
3C-04	CHENG, Erh-Hsiang (00017350)	Application of Forward Osmosis to Concentrate Waste Industrial Liquor	69
3C-05	HARA, Koki (00017352)	Efficacy of a Two-compartment Electrochemical Flow Cell Introduced into a Reagent-free UV/Chlorine Advanced Oxidation Process	70
3C-06	OKAJIMA, Nattha (00017353)	Time Series Analysis of Environmental Changes of Dili Capital in Timor-Leste by using Satellite Remote Sensing and GIS Technology	70
3C-07	YAEGASHI, Sakiko (00017354)	The Ssearch for the Habitats of Aquatic Caddisfly Stenopsyche marmorata (Trichoptera) from Environmental DNA using Species-specific Microsatellite Markers	71
3C-08	QIN, Yu (00017356)	Feasibility of Hythane Recovery from Recirculated Two-Phase Anaerobic Digestion of Food Waste and Paper Waste	71
3C-09	JIKUMARU, Atsushi (00017358)	Development of High Efficiency Concentration Method of DNA from River Water by Combined Process of Coagulation and Form Separation	72
3C-10	CANCEL		
3C-11	MAHARJAN, Amit Kumar (00017362)	Ammonium-Nitrogen Removal from Groundwater by Integrated Constructed Wetland Reactor	72
3C-12	RISTYA, Wika (00017363)	Flood Scenarios Considering Changes of Rainfall Characteristics and Land Use in the Upper Citarum River Basin, Indonesia	73
3C-13	WARUNYUWONG, Passaworn(00017364)	Energy Cost Reduction in Shrimp Cultivation by Using Liquid-Film-Forming Apparatus	73
3C-14	POOPIPATTANA, Chomphunut (00017366)	Effects of Rainfall Characteristics and Tidal Changes on Behavior of CSO-derived Sewage Markers in Odaiba Coastal Area, Tokyo	74
3C-15	TSUCHIKAWA, Masanori (00017367)	De Novo Transcriptome Sequencing of a Benthic Ostracod Heterocypris Incongruens Exposed to Zinc	74
3C-16	MIYAZONO, Akira (00017368)	Effect on sand supply to foreshore by beach nourishment on the Miyazaki Coast	75
3C-17	YOSHIDA, Gen (00017383)	High-rate Anaerobic Treatment of Sewage Sludge Using a Combined Hyper Thermal Solubilization and Membrane Separation System	75

Session 4A Sunday, July 15th Chair: NISHIMURA, Fumitake

Oral presentation: 10:50-12:00, Poster viewing: 12:00-13:10, Put up poster by 8:30 Sunday, July 15th

	Speaker	Title	Page
4A-01	RIZA, Sativandi (00017370)	Hyper-Scale Digital Soil Mapping to Predict Soil Textures	76
4A-02	RAHMANI, Aulia Fajar (00017372)	Understanding Adhesion and Biofilm Formation of Bacterial Cells at Different Growth Phases	76
4A-03	NISHIMURA, Emi (00017373)	Comparison of Antibiotic-Resistant Escherichia coli Collected from Uninhabited Island and Urban Ponds in Miyazaki, Japan	77
4A-04	KOTCHAROEN, Wilasinee (00017374)	Formation of Denitrifying Granular Sludge in USB Reactor with Municipal Sewage as Carbon Source	77
4A-05	WIRASNITA, Riry (00017376)	Isolation and Characterization of Bisphenol A-Degrading Bacterium from Common Reed-Planted Constructed Wetland	78
4A-06	SUZUKI, Takaaki (00017377)	Water Insecurity Perception Affected by Water Availability and Daily Water Use Practice in Kathmandu Valley	78
4A-07	UEDERA, Keita (00017378)	Synthesis of Layered Double Hydroxide/Magnetite Composite Adsorbent for Phosphorous Recovery	79
4A-08	NGUYEN, Thao Hoang Phuong (00017384)	Different Fates of FRNA Phage Genotypes in a Sequencing Batch Reactor Treating Domestic Wastewater in a Satellite City of Hanoi	79
4A-09	BILLATEH, Asma (00017387)	The Use of Sap from Felled Oil Palm Tree as Low-cost Nutrient Source for Lactic Acid Production	80
4A-10	ITO, Erika (00017391)	Temporal Variation of Rotavirus in Cultured Oysters and Its Relation to Gastroenteritis Epidemics in Japan	80
4A-11	TAROEPRATJEKA, Dyah Asri (00017403)	Hydrogen Producing Ability of Extremely Halotolerant Bacteria from Salt-Damaged Soil in Thailand	81
4A-12	Changed to 4B-01		
4A-13	NAKAYAMA, Kei (00017410)	Introduction to ChemTHEATRE: a Platform to Utilize the Published or Public Data of Environmental Monitoring	81
4A-14	KOBAYASHI, Norihiro (00017411)	Environmental Monitoring and Fate Prediction of Human Pharmaceuticals in Japanese River Water	82
4A-15	PROMRO, Pimmanat (00017419)	A Bench-Scale Assessment of Argon-Oxygen Plasma Treatment for Organic pollutants Removal from Landfill Leachates	82
4A-16	YAMAMOTO, Koichi (00017420)	Suspended Peat Particle Flux at the Northern Part of the Bengkalis Island	83
4A-17	PROKHOROVA, Anna (00017423)	Performance Optimization of the Electrotrophic Denitrification for a Sustainable Treatment of Nitrate-Contaminated Swine Wastewater	83

uly 15th
Page
51
51
52
52
53
53
54
54
55
55
56
56
57
57
58
58

July 15th
Page
59
59
60
60
61
61
62
62
63
63
64
64
65
65
66
66
67

Sunday, July 15th
Session 4A Oral presentation: 10:50-12:00, Poster viewing: 12:00-13:10 Chair: NISHIMURA, Fumitake

4A-11

Hydrogen Producing Ability of Extremely Halotolerant Bacteria from Salt-Damaged Soil in Thailand

Dyah Asri Handayani TAROEPRATJEKA*,, Tsuyoshi IMAI*, Prapaipid CHAIRATTANAMANOKORN***, Alissara REUNGSANG****,*****

**Graduate School of Sciences and Technology for Innovation, Yamaguchi University, Yamaguchi 755-8611, Japan*
***Department of Environmental Engineering, Institut Teknologi Nasional, Bandung, Jawa Barat 40124, Indonesia*
****Department of Environmental Technology and Management, Faculty of Environment, Kasetsart University, Bangkok 10900, Thailand*
*****Department of Biotechnology, Faculty of Technology, Khon Kaen University, Khon Kaen 40002, Thailand*
******Research Group for Development of Microbial Hydrogen Production Process from Biomass, Khon Kaen University, Khon Kaen 40002, Thailand*

In this research, extremely halotolerant hydrogen-producing bacteria from salt-damaged soil in Thailand were investigated. By utilizing them in dark fermentation process to produce biohydrogen from sugars acquired from waste sources, these extremophilic bacteria can offer the advantage of cost cutting for fresh water, oxygen and sterilization in the development of 'Next Generation Industrial Biotechnology'. The biohydrogen production experiments at 3-10% and 15-26% NaCl were conducted. A comparison study was made before and after acclimatization period of 2 years. During the acclimatization period, the substrate for the bacteria was kept at 26% NaCl condition. The result showed that before the acclimatization period, the highest production of 2.78 mol $H_2/mol_{glucose}$ occurred at 15% salinity, with no hydrogen production observed at 26% salinity. After the acclimatization, the results showed that hydrogen production was possible at 26%, with hydrogen yields of 0.66–1.15 mol $H_2/mol_{glucose}$. This indicates that extremely halotolerant hydrogen-producing bacteria can exist under high salt concentrations. Further studies will be made to investigate the microbial community characteristics and their applications for hydrogen production from lignocellulosic biomass.

4A-13

Introduction to ChemTHEATRE: a Platform to Utilize the Published or Public Data of Environmental Monitoring

Kei NAKAYAMA*, Tomohiko ISOBE, Seiichi UNO***, Itsuki C HANDOH****, Nobuaki OHNO*****, Tatsuya KUNISUE***

**Center for Marine Environmental Studies, Ehime University, Matuyama 790-8577 Japan*
***Center for Environmental Health Science, National Institute for Environmental Studies, Tsukuba, Japan*
****Education and Research Center for Marine Resources and Environment, Faculty of Fisheries, Kagoshima University, Kagoshima, Japan*
*****College of Creative Studies and Institute of Science and Technology, Niigata University, Niigata Japan*
******Graduate School of Simulation Studies, University of Hyogo, Kobe, Japan*

There is a general trend toward the growing importance of open data worldwide. It appears to be essential that development of scientific data repositories be accelerated. In the field of environmental chemistry and ecotoxicology, a huge number of monitoring data on chemicals in various environmental and biological specimens have been reported in scientific journals. However, comprehensive, public repositories to store such valuable data set of the chemicals do not exist; researchers are forced to spend lots of time and cost in collecting and utilizing the published data, when modelling environmental behavior and fate of, and performing the risk assessment for, the chemicals of interest. Therefore, it is desirable that various stakeholders in the field should work together to improve and promote secondary use of the data. To this end, we have created a platform to register and visualize the monitoring data of environmental contaminants, named 'ChemTHEATRE' (http://chem-theatre.com/). To date, data described in more than 60 publications have been registered on the platform. Users can find e-archived chemical concentration data in the environmental and biological specimens each with associated metadata such as sampling date and location, species, and biometrics, in addition to the detailed description of experimental methods.

WET2018 Committees

WET2018 Program and Abstract

Issued on 14th July 2018

Japan Society on Water Environment	Green Plaza Fukagawatokiwa 201 2-9-7 Tokiwa Koto 135-0006 Tokyo, Japan +81-3-3632-5351
Taiyo Bijutsu (Printing office)	2-7-11 Kiyosumi Koto 135-0024 Tokyo, Japan +81-3-3642-6045

Water and Environment Technology Conference 2018 (WET 2018)

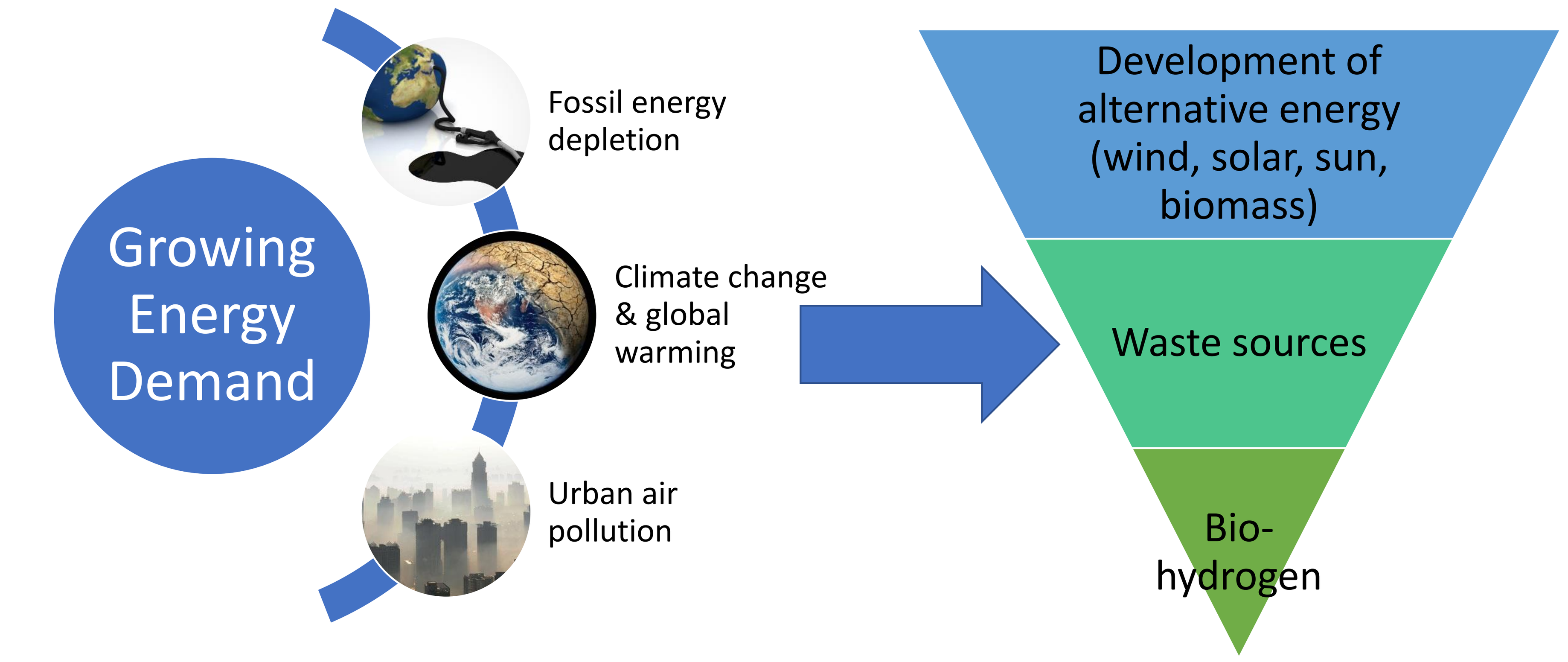
4A-11

Hydrogen Producing Ability of Extremely Halotolerant Bacteria from Salt-Damaged Soil in Thailand

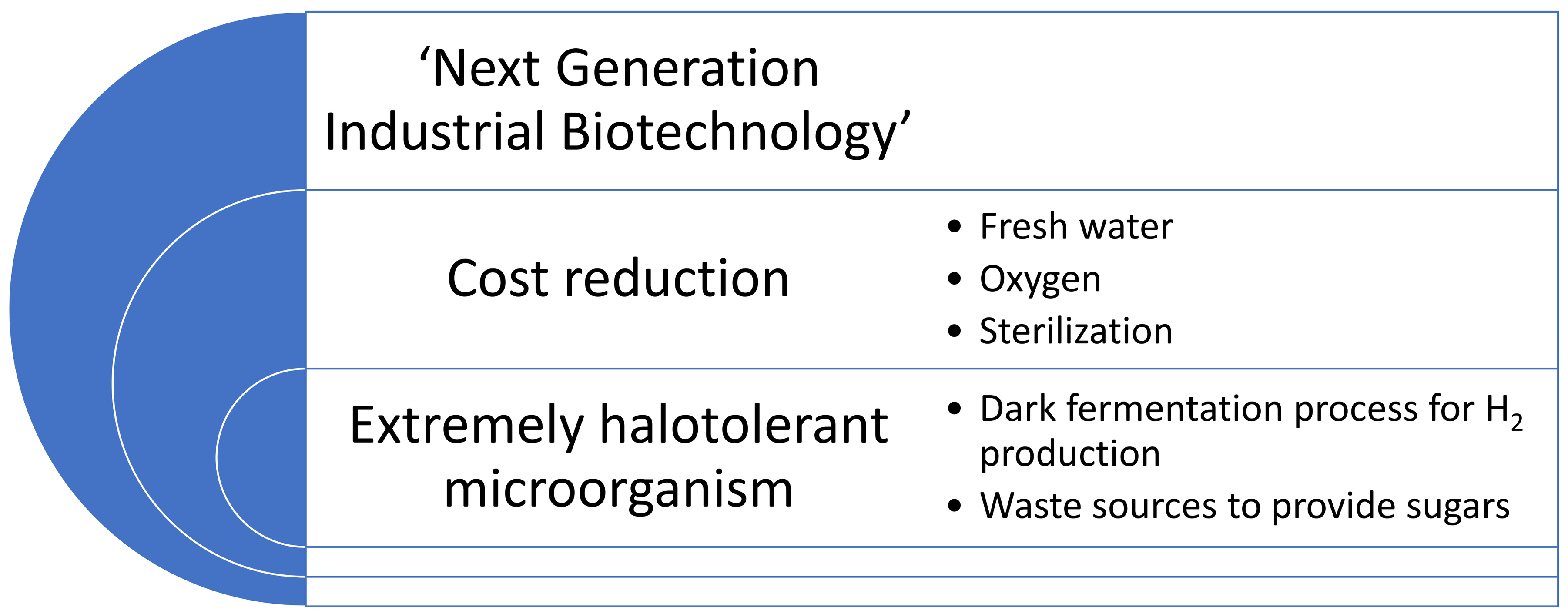
Dyah Asri Handayani TAROEPRATJEKA*,, Tsuyoshi IMAI*, Prapaipid CHAIRATTANAMANOKORN***, Alissara REUNGSANG****,*******

**Graduate School of Sciences and Technology for Innovation, Yamaguchi University, Yamaguchi 755-8611, Japan*
***Department of Environmental Engineering, Institut Teknologi Nasional, Bandung, Jawa Barat 40124, Indonesia*
****Department of Environmental Technology and Management, Faculty of Environment, Kasetsart University, Bangkok 10900, Thailand*
*****Department of Biotechnology, Faculty of Technology, Khon Kaen University, Khon Kaen 40002, Thailand*
******Research Group for Development of Microbial Hydrogen Production Process from Biomass, Khon Kaen University, Khon Kaen 40002, Thailand*

1. Introduction



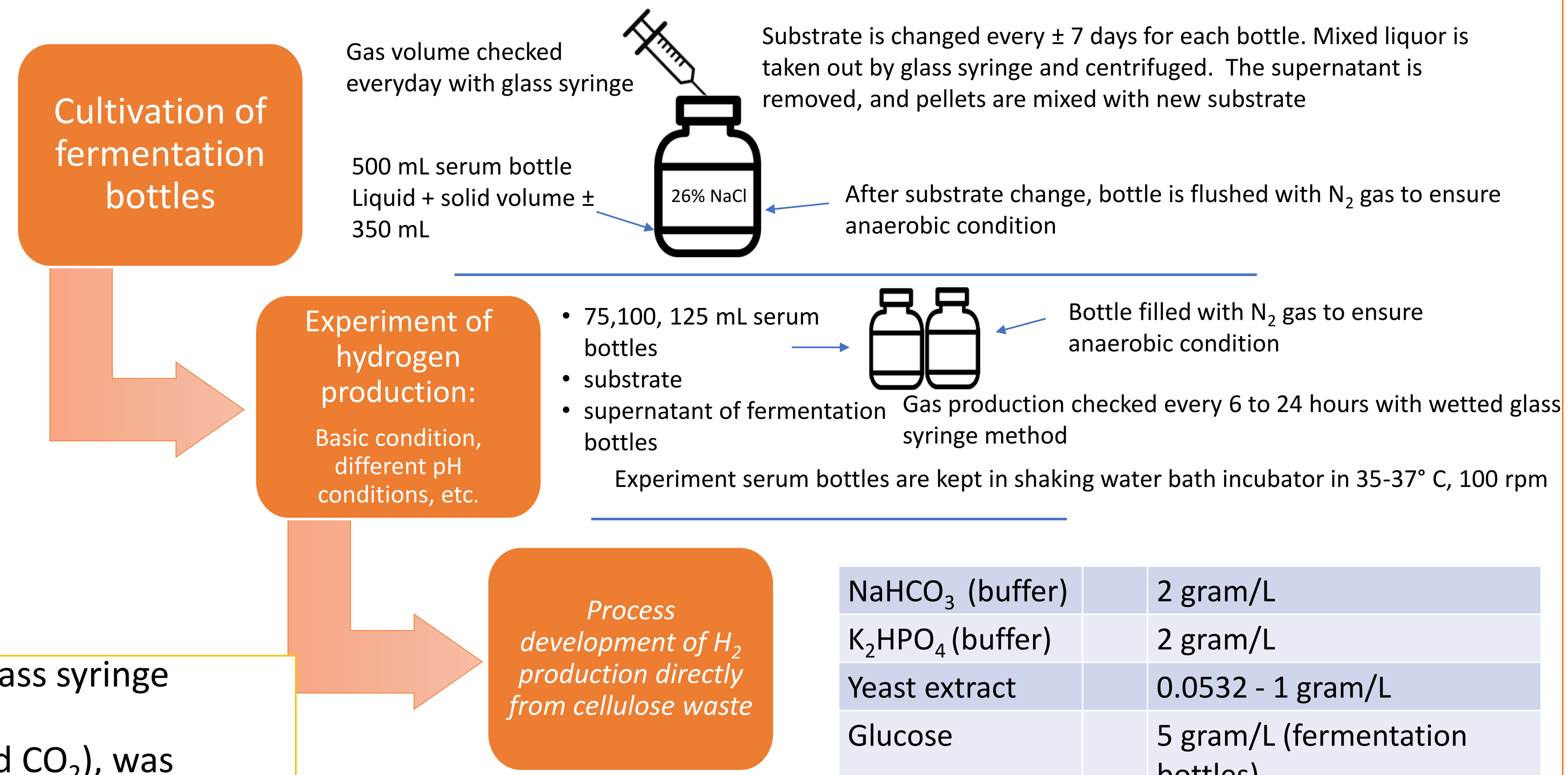
- Hydrogen gas has the highest energy density of common fuels expressed on a mass basis.



Objectives:
- to investigate hydrogen production by extremely halotolerant bacteria
- to analyze bacterial community structure difference before and after acclimatization in saturated NaCl condition

2. Materials and Methods

Salt-damaged soil (Khon Kaen, Thailand)



- Gas volume is measured by wetted glass syringe method.
- Composition of biogas (H_2, N_2, CH_4 and CO_2), was measured by gas chromatography (GC-8APT/TCD; Shimadzu Corp. Japan) with activated charcoal 60/80 mesh column and Argon as carrier gas.
- Polymerase chain reaction-denaturing gel electrophoresis (PCR-DGGE) was used to study bacterial community structure differences before and after acclimatization.

$NaHCO_3$ (buffer)		2 gram/L
K_2HPO_4 (buffer)		2 gram/L
Yeast extract		0.0532 - 1 gram/L
Glucose		5 gram/L (fermentation bottles)
NaCl		3-10%, 15-26% w/v (26% =351.35 gram/L)
Trace elements	A	2 mL/L
	B	10 mL/L
	C	1 mL/L

A	$(NH_4)_2HPO_4$	350 gram/L
B	KCl	75 gram/L
	NH_4Cl	85 gram/L
	$FeCl_3 \cdot 6H_2O$	42 gram/L
	$MgCl_2 \cdot 6H_2O$	81 gram/L
	$MgSO_4 \cdot 7H_2O$	25 gram/L
	$CoCl_2 \cdot 6H_2O$	1.8 gram/L
C	$CaCl_2 \cdot 2H_2O$	150 gram/L

Standard Gibbs energy of formation for glucose fermentation

Equations of fermentative reactions		ΔG^0
$C_6H_{12}O_6 + 4H_2O \rightarrow 2CH_3COO^- + 2HCO_3^- + 4H^+ + 4H_2$	(1)	-206 kJ
$C_6H_{12}O_6 + 2H_2 \rightarrow CH_3(CH_2)_2COOH + 2CH_3COO^- + H^+ + 2H_2$	(2)	-254 kJ

Equation (1): 1 mol of glucose will produce 4 mol of hydrogen → 1 g of glucose STP conditions produce 498 mL of H_2 via the acetic acid (HAc) pathway
Equation (2): 1 mol of glucose will produce 2 mol of hydrogen →1 g of glucose at STP conditions produce 249 mL of H_2 via the butyric acid (HBu) pathway

$$\textbf{Hydrogen yield}\ (\%) = \frac{\textbf{Observed cumulative hydrogen (mL)}}{\textbf{Theoretical cumulative hydrogen (mL)}} \times 100$$

3. Results

Biohydrogen production at 3–10% salinity of salt-damaged soil from Khon Kaen

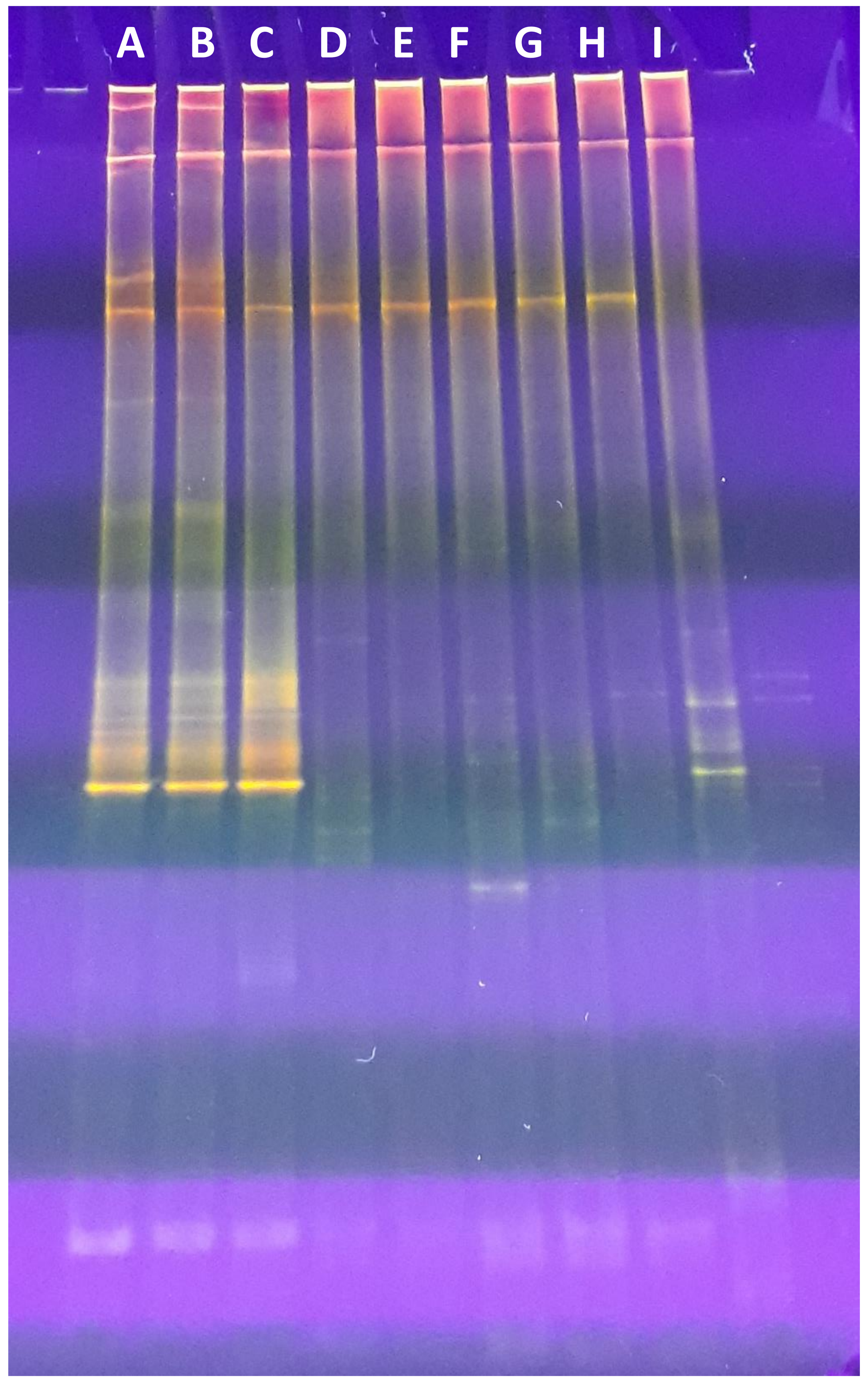
Salt concentration (%)	Biohydrogen production (ml)	Theoretical H_2 production (%) HAc pathway	Theoretical H_2 production (%) HBu pathway	Yield ($molH_2$/ $mol_{glucose}$)
3	10.9	14.7	29.5	0.61
3.5	10.9	14.7	29.5	0.61
5	9.46	12.8	34.6	0.53
7	13.4	18.1	36.2	0.75
7.5	7.43	10	20.1	0.41
10	18.1	24.5	49	1.01
Glucose 0.15 g (5,000 mg/L), inoculum 3,000 mg/L VSS, F/M ratio 1.5				

Biohydrogen production at 15–26% salinity of salt-damaged soil from Khon Kaen

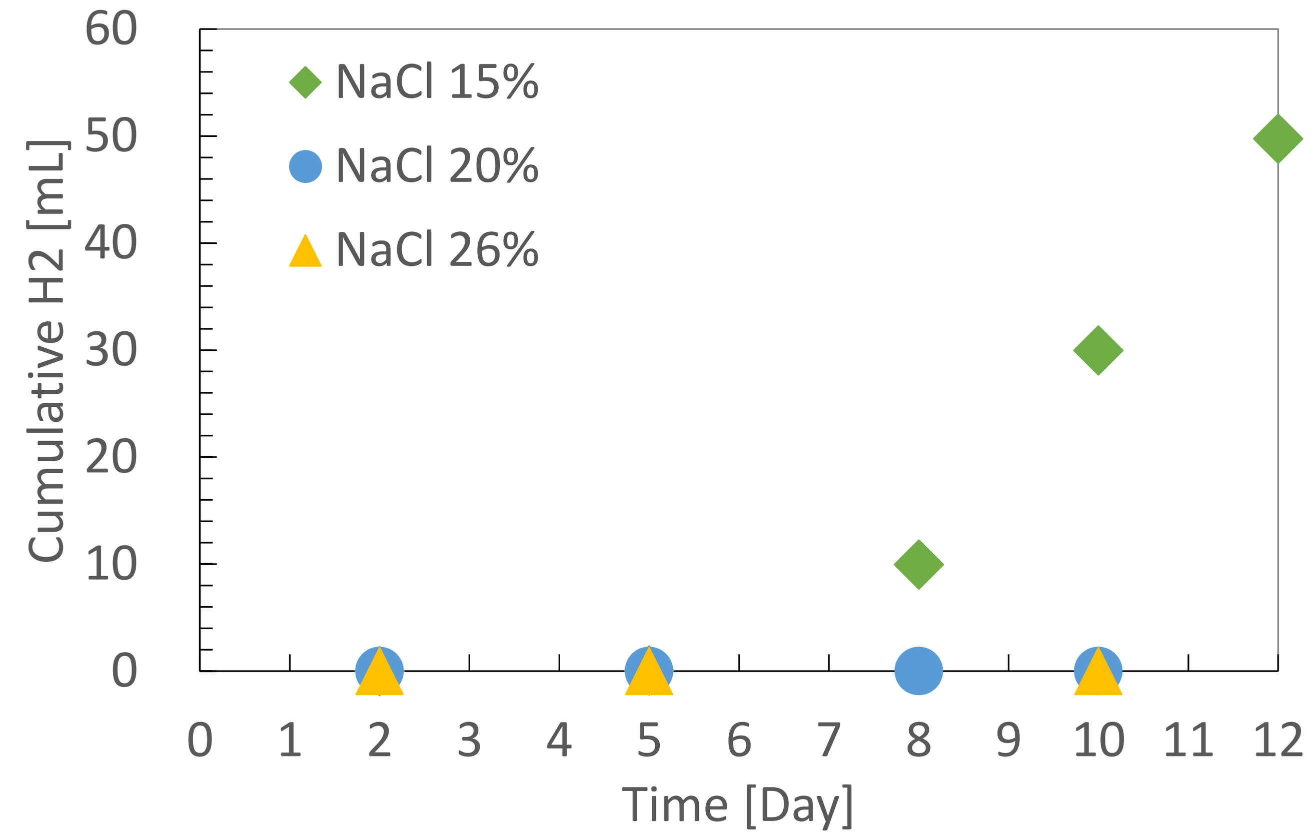
Salt Concentration (%)	Biohydrogen production (ml)	Theoretical H_2 production (%) HAc pathway	Theoretical H_2 production (%) HBu pathway	Yield ($molH_2$/ $mol_{glucose}$)
15	49.8	67.3	134.6	2.78
20	0.02	0.03	0.05	0.00
26	0	0	0	0.00
Glucose 0.15 g (5,000 mg/L), inoculum 3,000 mg/L VSS, F/M ratio 1.5				

Biohydrogen production at 26% salinity after two years of acclimatization

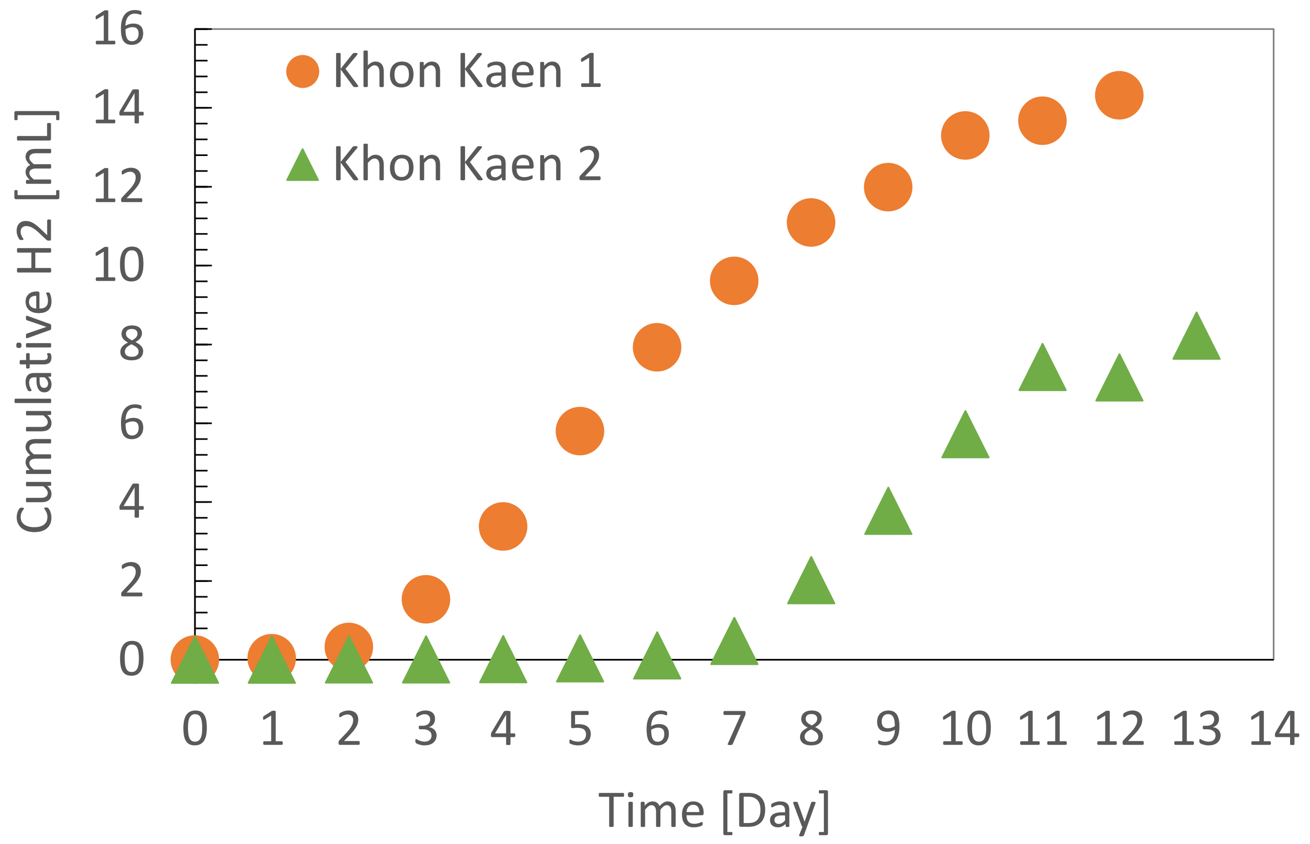
Soil Sample	Biohydrogen production (ml)	Theoretical H_2 production (%) HAc pathway	Theoretical H_2 production (%) HBu pathway	Yield ($molH_2$/$mol_{glucose}$)
Khon Kaen salt damaged soil (1)	14.31	28.76	57.55	1.15
Khon Kaen salt damaged soil (2)	8.22	16.53	33.07	0.66
Glucose 0.12 g (5,000 mg/L), inoculum 10 mL (3 mg/L VSS)				



DGGE profiles of V3 region of 16s rDNA of acclimatized culture (A,C) and soil samples of Khon Kaen (D,E,F)



Cumulative hydrogen production before acclimatization



Cumulative hydrogen production after 2 years of acclimatization

4. Conclusions

- After acclimatization, it was possible to produce biohydrogen under high salt concentration (26% w/v NaCl) with hydrogen yields of 0.66–1.15 mol H_2/$mol_{glucose}$.
- Biohydrogen production indicates that extremely halotolerant hydrogen-producing bacteria can exist under high salt concentrations.
- PCR-DGGE confirmed that changes in microbial community structure have occurred after 2 years of acclimatization in saturated NaCl condition.

****

Japan Society on Water Environment (JSWE)
Green-Plaza-Fukagawa-Tokiwa #201
2-9-7 Tokiwa, Koto-ku, Tokyo 135-0006 Japan
Tel. +81-3-3632-5351 Fax. +81-3-3632-5352
http://www.jswe.or.jp

****

July 15th, 2018

This is to certify that

Ms. Dyah Asri Taroepratjeka

Yamaguchi University

had participated in the Water and Environment Technology Conference (WET2018) officially organized by Japan Society on Water Environment from 14th to 15th July, 2018, held at Ehime University (Bunkyo-cho 3, Matsuyama, Ehime, Japan),
and had presented the presentation entitled "Hydrogen Producing Ability of Extremely Halotolerant Bacteria from Salt-Damaged Soil in Thailand".

.

WATANABE Kozo,
Secretary of WET2018,
Japan Society on Water Environment
Professor,
Ehime University