

サイエンス・ダイアログ 実施報告書

1. 学校名・実施責任者氏名: 山梨県立日川高等学校 風間 栄一
2. 講師氏 Dr. Bikash Malla (Mr.)
3. 講義補助者氏名: 平井 聡一郎
4. 実施日時: 令和 5 年 9 月 28 日 (木) 14:00 ~ 15:40
5. 参加生徒: 1 年生 39 人 2 年生 38 人
備考: SSHクラス所属の生徒
6. 講義題目 Water problems in Nepal and efforts to solve them
Wastewater-based epidemiology
6. 講義概要
 - ・Water problems in Nepal and efforts to solve them
 - ・Monitoring COVID-19 and other pathogenic diseases
7. 講義形式:
 - 1) 講義時間 80 分 質疑応答時間 10 分
 - 2) 講義方法
対面講義
 - 3) 事前学習
 ・ 無
使用教材 事前に送られた資料の要約英文と語彙集について作成したワークシート
8. その他特筆すべき事項:
 - ・本校 ALT の協力を得て事前学習を行った。

Form B-2
(FY2023)
Must be typed

Date (日付)
29/09/2023
(Date/Month/Year: 日/月/年)

Activity Report -Science Dialogue Program-
(サイエンス・ダイアログ事業 実施報告書)

- Fellow's name (講師氏名): Bikash Malla (ID No. P22365)

- Name and title of the accompanying person (講義補助者の職・氏名)
平井 聡一郎(ひらい そういちろう) 修士2年

- Participating school (学校名): Hikawa Senior High School

- Date (実施日時): 28/09/2023 (Date/Month/Year: 日/月/年)

- Lecture title (講義題目):

Title 1. Water problems in Nepal and efforts to solve them.

Title 2. Wastewater-based epidemiology: Monitoring COVID-19 and other pathogenic diseases.

- Lecture format (講義形式):

◆ Onsite ・ Online (Please choose one.)(対面 ・ オンライン)((どちらか選択ください。))

◆Lecture time (講義時間) 85 min (分), Q&A time (質疑応答時間) 5 min (分)

◆Lecture style (ex.: used projector, conducted experiments)

(講義方法 (例: プロジェクター使用による講義、実験・実習の有無など))

Used projector

- Lecture summary (講義概要): Please summarize your lecture within 200-500 words.

Globally, 663 million people lack access to clean drinking water, particularly affecting poor regions with sanitation issues. Kathmandu Valley, Nepal, faces a clean water shortage, forcing people to use potentially unsafe sources due to high demand and inadequate piped water supply. These sources often contain harmful bacteria and pathogens from human and animal waste, leading to waterborne diseases.

Kathmandu Valley is suffering with waste management challenges, including leaky sewer pipes, malfunctioning wastewater treatment plants, improperly constructed septic tanks, and substantial animal waste. Identifying the source of water contamination is essential. Microbial source tracking (MST) assists in identifying the origin of contamination, whether it originates from humans, livestock, or other animals, and aids in the development of strategies to mitigate water contamination.

Our study revealed that different water sources in the valley were contaminated with feces from different hosts. Groundwater sources were mainly contaminated with human feces, followed by cow, chicken, pig, and dog feces.

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In conclusion, it's crucial to clean up these water sources to prevent diseases and make sure everyone has safe drinking water.

Wastewater-based epidemiology (WBE) helps to detect the presence of a virus such as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a causative agent of Coronavirus Disease 2019 (COVID-19) in an entire community, even before individuals show symptoms. This is precisely what WBE allows us to do. By monitoring wastewater, we can track the prevalence of diseases, helping public health officials respond swiftly to outbreaks and protect communities.

This technique has been instrumental in tracking the spread of not only COVID-19 but also to detect various pathogens, giving us an early warning system for diseases such as polio, norovirus, and antibiotic-resistant bacteria.

Since 2020, we have been monitoring SARS-CoV-2 in wastewater within Yamanashi Prefecture. Our approach involves the regular collection of wastewater samples from all five major wastewater treatment plants across the region. These samples are then processed in our University of Yamanashi laboratory, where we employ the quantitative polymerase chain reaction (qPCR) technique to detect the presence of SARS-CoV-2 RNA.

Our commitment to public health extends further as we regularly share our findings with relevant authorities, ensuring that our data contributes to informed decision-making.

For those interested in staying informed, we offer weekly updates on our wastewater-based epidemiology results, which can be accessed on the Yamanashi CDC website. This transparency and collaboration underline our dedication to fighting the spread of COVID-19 and safeguarding the health of our community.

Weekly data of WBE result can be viewed on Yamanashi CDC website:
https://www.pref.yamanashi.jp/kansensho_portal/index.html

◆Other noteworthy information (その他特筆すべき事項):

- Impressions and comments from the accompanying person (講義補助者の方から、本事業に対する意見・感想等がありましたら、お願いいたします。):

It was an opportunity to interact with the students and help them grasp the lecture's content.



Self introduction

Doctor of Veterinary Science and Animal Husbandry	Institute of Agriculture and Animal Science, Yamaguchi University, Yamaguchi (2008 - 2010)
Senior Manager (Sales and Technical Customer services)	ProteinTech Solutions Private Limited, Kufambwa, Nepal (2008 - 2010)
Master of Engineering	University of Yamaguchi, Japan (October 2010 - March 2010)
Doctor of Philosophy (PhD), Engineering	University of Yamaguchi, Japan (April 2010 - March 2010)
Post-doctoral researcher	University of Yamaguchi, Japan (April 2010 - November 2010)
Japan Society for the Promotion of Science (JSPS) Post-doctoral Fellow	University of Tsukuba, Japan (December 2010 - Current)