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（学校用）

様式 A-1
(FY2025)

2025 年 9 月 25 日

サイエンス・ダイアログ　実施報告書

1. 学校名：神戸市立六甲アイランド高等学校

2. 講師氏名： Dr. Ako Andrianto

3. 講義補助者氏名： 田崎　智也 様

4. 実施日時： 2025 年 9 月 22 日 （月） 15 ： 40 ～ 17 ： 00

5. 参加生徒： 1 年生 6 人、 2 年生 5 人、近隣のインターナショナルスクールより4人 （合計 15 人）
   備考：（例：理数科の生徒）

6. 講義題目：タイリクヒメハナカメムシにおける高温耐性と共生微生物の関係

7. 講義概要：地球上における微生物や昆虫が、どのように生態系の中で機能しているかについてご講演いただいた。
   その後、本校の生徒が研究中のプロジェクトのプレゼンテーションを聞いていただき、アドバイスやフィードバックをいただいた。

8. 講義形式：
   ☑対面 ・ □オンライン （どちらか選択ください。）
   1) 講義時間 350 分 質疑応答時間 10 分

   2) 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）
      プロジェクター使用による講義

   3) 事前学習
      □有 ・☑ 無 （どちらか選択ください。）
      使用教材：

9. その他特筆すべき事項：

For Web posting

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Form B-2
(FY2025)
Must be typed

Date（日付）
25/09/2025 （Date/Month/Year: 日/月/年）

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

- Fellow's name（講師氏名）: Eko ANDRIANTO （ID No. P25103 ）

- Name and title of the lecture assistant（講義補助者の職・氏名）
Tomoya Tasaki (Graduate Student, M2)

- Participating school（学校名）: Kobe Municipal Rokko Island High School

- Date （実施日時）: 22/09/2025 （Date/Month/Year:日/月/年）

- Lecture title（講義題目）:
Strengthening the Biological Control of Invasive Pests: From Classical Approaches to Enhancing Natural Enemy Resilience

- 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） 45 min（分）, Q&A time（質疑応答時間） 10 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））
Pre-presentation (specimen introduction; lecture assistant help me), used projector, communicative presentation

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

This lecture begins with a short pre-presentation session, where insect specimens are introduced with the help of a lecture assistant. This initial activity is designed to familiarize students with the material in a direct and engaging way, stimulating curiosity and providing a tangible connection to the topic. By observing specimens, students gain a more concrete sense of insect diversity and ecological roles, which sets the stage for the main lecture.

Following this introduction, I briefly present my country, my educational background and research interests, which broadly span Molecular Taxonomy, Ecology and Evolution, Biological Control, and Endosymbiosis. From this foundation, I move toward applied entomology, focusing specifically on the use of insects in biological control.

Biological control, or the utilization of natural enemies to regulate pest populations, has long been recognized as an essential component of sustainable agriculture. Predators, parasitoids, and pathogens can reduce pest damage and contribute to environmentally friendly

crop protection strategies. However, despite their importance, natural enemies also face certain limitations, particularly when they encounter novel environments or changing climatic conditions especially in the classical biological control (CBC) which often introduced natural enemies to the non-native regions. Their survival, reproduction, and efficiency as pest regulators may be constrained, which in turn can reduce the overall success of biological control programs.

At this point, I introduce a potential biological mechanism that helps insects overcome such challenges: the role of microbial symbionts. Many insects harbor bacterial partners that influence their physiology, behavior, and ecological adaptability. Symbionts can provide nutritional benefits, enhance tolerance to environmental stress, and even affect host–parasite interactions. Recent research has demonstrated that these microorganisms may significantly expand the adaptive potential of their insect hosts, including natural enemies used in biological control.

The main focus of my ongoing research under the JSPS Postdoctoral Fellowship is to investigate how bacterial symbionts shape the adaptability and resilience of insect natural enemies. By exploring symbiont diversity, function, and transmission, my work aims to understand whether symbiont-mediated processes can be harnessed to enhance the performance of biological control agents under stress conditions such as heat or limited resources. Ultimately, this line of research seeks to contribute not only to the advancement of insect ecology but also to the practical improvement of sustainable pest management systems.

Through this lecture, I hope to offer students an integrated view of insect roles in ecosystems, the principles and limitations of biological control, and the promising potential of symbiont-based innovations for agriculture and beyond.

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

We also set aside time for students to present their projects. It was impressive to see their efforts to understand phenomena (antibiotic) and local traditions (use of leaves) from a scientific perspective, and they were able to deliver their findings in English, which can inspire other students to think globally and aim for broader impact.

- Impressions and comments from the lecture assistant（講義補助者の方から、本プログラムに対する意見・感想等がありましたら、お願いいたします。）:

This program is good for students who want to become researchers because it is almost impossible for students to receive lectures from outstanding researchers from overseas. The genuine opinions of high school students were also beneficial to us in advancing our research. I was impressed to see high school students presenting in English. They should feel confident because not everyone can do that.


Entomology: Studying Earth's Natives
Estimated proportions of living organisms on Earth (if which >70% are insects (approximately 0.5 million species)
Herbivores – feed on plants
Carnivores – predators, parasitoids, parasites
Omnivores – feed on both plants and animals
Detritivores/Decomposers – feed on and break down organic matter
Specialists – pollinators, fungus feeders, symbiotic insects
Can you explain the role of the insect you brought today in nature?