

(For JSPS Fellow)

Form B-5

Date (日付)

19/06/2015 (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): Claudia Sofia Leite Vicente (ID No. P14394)
- Participating school (学校名): Suwa Seiryō High School, Suwa, Nagano
- Date (実施日時): 18/06/2015 (Date/Month/Year: 日/月/年)
- Lecture title (講演題目): (in English) The invisible world of bacteria – Study of Nematode-bacteria association (in Japanese)
- Lecture summary (講演概要): Please summary your lecture 200-500 words.

My lecture was intitled The "invisible world of bacteria" and aimed, firstly, introducing my scientific background and, secondly, my present research has a JSPS postdoctoral fellow. The first slides of my presentation were dedicated to present myself, my country/city and a brief historical introduction about Japan and Portugal long collaboration. I have also tried to inspire the students to follow a scientific career by talking about my personal experience, and introduced my main background in Microbiology (history and day-life applications). The second part of the presentation was dedicated to my research programme in Japan, mainly the study of bacteria role in Pine Wilt Disease (PWD). PWD is considered the most devastating forest disease worldwide, and was identified firstly in Japan in 1905. I have explained the history and the mechanism of PWD and presented my recent results regarding the study of nematode-bacteria relation, namely the beneficial effect towards the nematode in oxidative stress conditions. I have tried to explain these results by presenting the scientific method – hypothesis-experiment-conclusion. Firstly, I have introduced the basic defence mechanism of plants. When subject to biotic (like nematode infection) or abiotic stresses, plant cells react by producing massive amounts of ROS (reactive oxygen species) which, more than trying to fight back the stress, also serve as systemic signalling molecules. The most predominant ROS produced is hydrogen peroxide. Based in this knowledge, my hypothesis was that associated bacteria of *Bursaphelenchus xylophilus* (pathogenic agent of PWD) were highly resistant to hydrogen peroxide and that by resisting to oxidative stress conditions, the bacteria can help the nematode to survive in the same conditions, for which the nematode is sensitive. First, we analysed the tolerance of both bacteria and nematode, alone and in association, and found that our hypothesis were corrected. Secondly, we have created a mutant bacteria sensitive to oxidative stress and tested once more the tolerance of wild-type bacteria, mutant bacteria and nematode, alone and in association. Our findings showed clearly the beneficial effect of

associated bacteria in oxidative stress conditions towards *B. xylophilus*. After the lecture, the students were able to observe *B. xylophilus*, by microscope, and also the animal model *C. elegans*. Both nematodes are not harmful for humans.

- Language used (使用言語): English

- Lecture format (講演形式):

◆Lecture time (講演時間) 40 min + 20 min experiments (分), Q&A time (質疑応答時間) 8-10 min (分)

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

(講演方法 (例: プロジェクター使用による講演、実験・実習の有無など))

In the lecture, I have used the school projector for my talk followed by a 20 min experiment. The experiment conducted was the microscopic observation of the animal model nematode *Caenorhabditis elegans* and the plant parasitic nematode *Bursaphelenchus xylophilus*. For observation, we used microscopes and binocular dissecting microscopes provided by the highschool.

◆Interpretation (ex.: assistance by accompanied person, provided Japanese explanation by yourself) (通訳 (例: 同行者によるサポート、講師本人による日本語説明))

Koichi Hasegawa, my JSPS tutor, have accompanied myself to the highschool and helped in translating the students questions in japanese as well as monitoring (with myself) students observations.

◆Name and title of accompanied person (同行者 職・氏名)

Koichi Hasegawa, lecture and PI at Environmental Biology Department of Chubu University.

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

Although the class was schedule to be from 14:30 till 15:30, I have began the lecture before 14:30 and also finished after 15:30. Professor Fujimaki print out presentation slides to deliver in the class.

- Impressions and opinions from accompanied person (同行者の方から、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。):

講義内容は非常に工夫されており、研究内容についての紹介だけでなく、母国ポルトガルについて日本との接点を紹介しながらお話し頂いたり、なぜ生物学者になったかといった体験談を話していただいたりした。非常にわかりやすい、聞き取りやすい英語であったため、多くの生徒たちも興味を持って聞いていた。英語で一生懸命質問する生徒も多く、また理科の先生からも質問が出たりと、皆が一緒に楽しめた講義であった。本事業は、サイエンスをとおした理想的なグローバル教育である。英語は目的ではなく、サイエンスをおこなううえでのツールであること、研究は世界を舞台にすめてゆくものであることを、早い時期から伝えることができ非常に良かったとおもう。