

(For JSPS Fellow)

Form B-5

Date (日付)

14/03/2017 (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): Javier Andres Montenegro Gonzalez (ID No. P16392 )
- Participating school (学校名): Okinawa Prefectural Kyuyo High School
- Date (実施日時): 22 / 2 / 2017 (Date/Month/Year: 日/月/年)
- Lecture title (講演題目): (in English) Evolution of body coloration in two freshwater fishes: the sensory-driven hypothesis  
(in Japanese) 淡水魚2グループにおける体色の進化: センサリドライブ仮説

- Lecture summary (講演概要): Please summary your lecture 200-500 words.

The lecture was divided primarily into three section; 1) information about my home country and city, 2) explained what it meant to be a scientist, and 3) gave a brief introduction about one of my currently undergoing research projects. Initalaly I showed to the students where my country is located and how the tropical weather is different from japan's weather; pointing out how this affect the kind and quantity of food available. I explained the culture of my city inside a historical background starting with the europea colonization and finishing with the republic of colombia as we know it now.

Later on, the lecture focus on my academic background, explaining clearly why and how I got to become an international scientist. I particularly pointed out why the scientific knowledge is important for humanity and how our scintific discoveries are more than our self, they belong to the colective knowledge and legacy of human kind. I continued my lecture explaining one of my current research. In this study I explained how the Sensory-driven hypothesis predicts that in species where sexual dimorphism exists, both the male mating traits and the female perceptual system are underlined by an adaptive process to the local environment. In order to test this hypothesis, we decided to investigate the convergent evolution of reddish coloration in males of genus *Oryzias* (medaka) and *Nomorhamphus* (sayori). While the phylogenetic analysis of genus *Nomorhamphus* is still in progress, the phylogeny of genus *Oryzias* reveals that the reddish coloration has independently evolved in several distant clades. In this study we collected a total of 40 individuals per genera along four localities; Asinua river, Moramo waterfall, Laweau river and Fotuno pond. Per population, we measured environmental transmittance, total carotenoids' content, opsin genes' expression on eyeballs, and analysed the sRGB body coloration profile. Our preliminary results indicate that in riverine environments, Asinua and Laweau, long

wavelengths were more abundant than short wavelength while in lacustrine environments, Moramo and Fotuno, short wavelength were dominant. Total carotenoids content was variable among populations in both genera, been lower in riverine populations and higher in lacustrine populations. Using a high-performance liquid chromatography spectrometry on Fotuno populations, we discover that both genera assimilate the same type of carotenoids. The expression profile of opsin genes in *Oryzias* differed considerably among populations while in genus *Nomorhanphus* it was relatively stable. The sRGB color profile analysis indicates that the coloration of *Oryzias* and *Nomorhamphus* per locality is more similar than the coloration among populations of the same genus. From our results, we conclude that despite the body coloration and total carotenoid contents of *Oryzias* and *Nomorhanphus* been correlated along localities, this trait is not likely to be sensory driven given that more reddish populations inhabit lacustrine environments where short wavelengths are more dominant. Furthermore, from the opsin expression profile analysis, we can speculate that the convergence in body coloration between *Oryzias* and *Nomorhamphus* might obey to different evaluative processes, nevertheless, further studies are required in other to corroborate or refuting this statement.

- Language used (使用言語): 90% English, clarifications in Japanese

- Lecture format (講演形式):

◆Lecture time (講演時間) 50 min (分), Q&A time (質疑応答時間) 30 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))

Used projector and slides

◆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))

I explained simple concepts in Japanese, but mostly got supported by the school staff

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

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

The assistant belonged to the school staff, unfortunately, I don't recall his name

- 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。):

He was very kind to help, and seem genuinely interested in understanding my lecture. I am very grateful for his help.