

Associate Professor Ryuichiro Machida – Seeking Truth through His Own Truth



Associate professor Ryuichiro Machida is an animal taxonomy lecturer at the University of Tsukuba. However, when not in Tsukuba, he is usually in the Sugadaira area of Nagano prefecture, Japan. He passionately conducts his research in one of the few laboratories located in mountainous area of Japan. The area also offers a rare observation site for different stages of forest succession.

Dr. Machida has been studying the relationships between Hexapoda, Chelicerata, Crustacea, and Myriapoda. Ultimately he is trying to reconstruct the arthropod taxonomical map. The unique point

of his research is that he studies the topic by comparative embryology, an approach taken only by his lab. Why only his lab?

Many researchers have left the field of comparative embryology due to the difficulty of making section samples, and because of the exciting possibilities of genome analysis. Yet disappointingly, genome analysis has not been much help for Dr. Machida's research since it only reveals the separation of the insect group about 450 million years ago, and leaves species relationships hidden behind the "noise". Dr. Machida is not against

the genomic approach, but he believes that revealing the insect "ground plan" is necessary in unveiling taxonomical relationships. For this, he believes researching homologous characteristics by comparative embryology is an effective method. His idea is often opposed for being too subjective but he points out that drawing conclusions with a personal view is unavoidable when it is based on an accumulation of personal experiences. We should not forget that the study of morphology was founded by Goethe, a historical philosopher. Dr. Machida's theme is grand,

and may not be recognized by all scientists, but he wishes to live through the field of comparative embryology with the "ground plan" as his lifelong theme. He believes that what is important is to be true to oneself and not to be dissuaded by others. This is very apparent in the passion he has for his field.

かわらばん Kawaraban

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Stepping Out into the Scientific City

For the students, it was a day to have fun yesterday. The excursion around Tsukuba's scientific facilities begun under a cheerful, sunny sky, but it was a little too hot to spend the day comfortably. Many students were fanning themselves and some from northern regions were wearing sunglasses. It was the hottest day of IBO2009 so far.

The tour visited three facilities which Tsukuba city is proud of: Ibaraki Nature Museum, AIST, and JAXA. Visitors can explore nature from different points of view at Ibaraki Nature Museum, and be exposed to the latest research and technology at AIST Science Square and JAXA. Another facility of AIST, the Geological Museum, was the place to check out Japan's past and present geological characteristics.

Ibaraki Nature Museum seemed to be the most interesting place to visit for the students. From the time they entered the museum, their eyes

fixed on the fossil of a mammoth at the entrance hall. They were intently taking pictures and looked disappointed when they had to leave there for orientation. After orientation, they looked around the seven usual exhibitions and one special exhibition, titled "Trace Fossils", where dinosaur footprints, fossils, and so-called 'living fossils' were displayed. These were perhaps the absolute favorites of many of the participants. Of course they are interested in anything to do with biology, but many were seen eagerly studying and taking photos of exhibits such as living horseshoe crabs and gigantic dinosaur footprints. They also made bookmarks using fallen leaves, which had been collected from all around Japan. They enjoyed choosing leaves and matching them to different colored base paper and strings, which clearly showed their individual sense. Some arranged leaves in the



shape of faces, fish, flowers and so on, and many wrote messages, their names, or words such as "IBO2009". The members of Team Argentina even wrote "Japan" in Japanese lettering (*kanji*). Visiting the museum must have been a good break between the exams.

Everyone seemed to enjoy them-

selves, and their only disappointment was that they did not have enough time to look around as much as they wanted. For these future scientists, who are hungry for knowledge, it was not enough to satisfy their curiosity. It was, however, a good opportunity to nurture their passion.

This is Japan

What's Your Choice?

Have you heard of "Doraemon" or "Sen to Chihiro no Kamikakushi" (Spirited Away)? These are popular titles within the world of *manga* (a Japanese form of comic strip) and *anime* (Japanese animated films). *Manga* and *anime* have been highly acclaimed worldwide because their stories are often attractive to both children and adults alike. The tales may express, for example, thought-provoking views of nature, views of the world, science, or many other themes.

Everybody attending IBO2009 is very knowledgeable about biology. Now, and in the future, you will probably spend a lot of time talking to others about science or research findings. When you're doing that, don't forget there are many forms of expression to convey your ideas. You might explain them in a thesis, a book, newspaper, picture book or science café. Alternatively, you could also present them in *manga* or *anime*!

NOVEL

LIFE



An Evolutionary Chimera: *Hatena arenicola*

Hatena arenicola is an extraordinary single-celled organism recently discovered by a graduate student, Dr. Noriko Okamoto, and her supervisor, Dr. Isao Inouye at the University of Tsukuba. Living symbiotically inside of *H. arenicola* is a deformed photosynthetic eukaryote—a kind of green alga called *Nephroselmis* sp.

When *H. arenicola* divides, only one daughter cell inherits the alga while the other cell develops predatory organs and seeks to take in new alga.

Because of this amazing process, *H. arenicola* is thought to demonstrate a form of evolutionary link between animals and plants. As such, it may hold the key to helping us understand mysteries in the diversity of life we see today.

Today's Quiz

The staple food of the Japanese people is rice. Rice grains are harvested six months after planting seedlings. At harvest time, how many grains of rice do you think can be obtained from one seed planted?

- A. 500
- B. 1600
- C. 3000



Answer to yesterday's quiz: B
When male fruit flies with the mutant gene 'satori' are put together, they chase each other's tails to form a "chain" as seen in the picture in the yesterday's quiz.

The Jury Behind the Doors

After enjoying a full day in Nikko on Tuesday, starting yesterday morning, the jury members began to discuss the theoretical exam questions for today. They had shown their playful side only the day before but switched overnight to their more serious and professional personas to participate in this weighty jury meeting. Not only are the jury members biology specialists, but they also seem to be experts at putting on their game faces when they need to.

Behind the heavy doors of the Congress Centre meeting room, the brains and combined knowledge of the Jury was assembled. Thanks to their hard work and high motivation, a high-level competition, judged to

be fair for all contestants, was eventually tailor-made. To aid the discussion, biology textbooks from each country were set along the side of the room. They all varied in size, volume, language, and appearance. Now and then jury members picked them up for reference.

Like all the contestants, the jury members themselves are the finest in their field, officially selected to represent their country's biology education. Despite their tough schedule, all these dedicated experts applied their stamina and enthusiasm for their country's contestants.

IBO is an arena for future biologists to challenge each others abilities. At the same time, it is also a chance to



benefit from the challenges thrown at them from today's biology experts. Everyone is looking forward to seeing what the challengers will be confronted with today, when the theoretical exam commences.

Sunny

Weather & Clothes

Today's Schedule

Students Schedule

- 6:30 - 8:00 Breakfast
- 9:30 - 16:00 Theoretical Exams
- 12:00 - 13:00 Lunch
- 18:00 - 20:30 Tsukuba Night

Jury & Observers Schedule

- 7:00 - 8:00 Breakfast
- 9:20 - 12:00 Excursion (Tsukuba Science Tour)
- 12:00 - 13:00 Lunch
- 13:00 - 16:00 Jury Session
- 16:00 Bus
- 18:00 - 20:30 Tsukuba Night
- 20:30 Bus

High 33°C
Low 23°C
Humidity 56%
Chance of rain 20%



<http://ibo2009.org/>

Students' Community of IBO (SCIBO) Team-J

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Get Ready for Tsukuba Night!

Tonight there will be an event called 'Tsukuba Night'. There'll be good food, chances to chat, great dance performances and much, much more. When you get there just forget about your exams and results and join in the fun!

Highlights of Tsukuba Night will be performances by Tokimeki Taiko-Juku drumming group and Kirikirimai dance group.

Tokimeki Taiko-Juku is a group that plays traditional Japanese instruments such as Japanese *wadaiko* drums. *Wadaiko* drums are an essential part of Japanese festivals—the deep sounds are so powerful. The group

said, "For IBO we'll be able to put on our biggest show, so we're really fired up. We're aiming for a high-spirited performance that will reach right to your heart. Please look forward to it!"

The second group is Kirikirimai which is organized by University of Tsukuba students, and they perform a dance called Yosakoi Soran. Actually, Yosakoi and Soran-bushi are individual traditional Japanese dances, from Kochi and Hokkaido respectively. However, the two dances have fused recently, and now it is performed and danced at festivals all over Japan. The dancers asked, "First, please watch our Yosakoi Soran performance

and feel the excitement in the rhythm. After that, we want you to join in. During the dance, please remember to say the key word "*dokkoisho*" with us. We hope we can become one big dance group together."

Both these acts will show you the fullness of the Japanese spirit at its most lively. This will be a heart to heart way to learn about Japanese culture.

So, get ready for a great night!

Mini Episode at the Museum

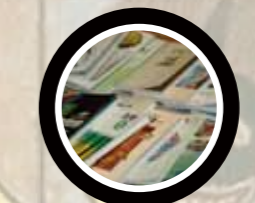
There was a small encounter at Ibaraki Nature Museum during the Science Tour yesterday. Students of a nearby elementary school were also visiting the museum, and there were some occasions for the children and the participants of IBO2009 to meet in the corridors. The children showed great interest in people from other countries and were gazing at them. Some had the courage to speak to them, and were saying "hello, hello" to the participants. It was a

heartwarming scene indeed, and it became more wonderful when some participants answered back "*konnichiwa*", the word "hello" in Japanese! This was another kind of precious communication which can be experienced at IBO.



**Background Picture:
Hujin Raijin Zu
by Tawaraya Sotatsu**

This glittering picture, "Hujin Raijin Zu", was drawn by Tawaraya Sotatsu at the beginning of the 17th Century and is his most famous masterpiece. The composition itself is especially noteworthy. The gods Hujin (on the right side) and Raijin (on the left side) are arranged at the furthest extremity of either end. The space in the middle, between the two gods, creates an ominous and tense atmosphere.



The Theoretical Exam Begins!

The practical exam was held on Tuesday, and today the IBO2009 competitors face their second trial—the theoretical exam. Let's hope they were able to regain some of their energy during the excursion.

This examination will be conducted from 9:30 to 16:00 - five hours excluding the 90-minute break for lunch. Competitors are required to apply their knowledge from a broad area of biology in order to solve the questions. In addition, speed and ability in arithmetic are prerequisites for any participant of IBO2009.

Since their pens, paper and knowledge are the only things they can rely on in a theoretical exam, some of them may find it

harder than the practical exam which can be easier for those with good hand skills.

But after the exams, an exciting event named "Tsukuba Night" (つくばナイト) is waiting for them. This event will be in a traditional Japanese festival style and should be an unforgettable night for all. There is a Japanese proverb "*Yoku manabe yoku asobe*" (よく学ばよく遊べ), which means "work while you work, play while you play". So we hope that, as this phrase suggests, competitors will avoid any later regrets by doing their very best both during the examination and while having fun!

Magnificent "G"

We introduced SCIBO (Students' Community of IBO) in the previous issue of Kawaraban. Today we'll tell you about the members of Team-G, who are very close to the IBO2009 competitors.

Participants must already know something about what Team-G is. Firstly, they wear pink T-shirts. The "G" in Team-G refers to "Guide" and that's exactly what they do. They guide and support the competitors in every way. They manage competitors' schedules, take care of their daily lives in an unfamiliar country, and even monitor their health. They are important staff supporting IBO2009 and its competitors.

Some members of Team-G helped with last year's Seibutsu Challenge (生物チャレンジ), which was held to select Team Japan for

IBO2009. Others are new members who joined from this year.

Team-G is united by a common feeling—as team guides they all feel connected to the members of their team. When their team is happy, they also feel happy. When their team has a problem, it is their problem too.

With frequent meetings, Team-G is in constant contact with each other, and always ready to solve any situation immediately, whenever a student has trouble.

Team-G has been making a great effort behind the scenes of IBO2009 and the event would not have been possible without them.