

Great Deeds of Bio-conservations in Insect World

Dialogue

By BI Weizi and LONG Yun

Akihiro Nakamura loves to climb trees, because he says magical creatures of the insect world only live on the highest branches. A researcher at Xishuangbanna Tropical Botanical Garden (XTBG), Chinese Academy of Sciences (CAS), Nakamura focuses on insect ecology, community ecology and conservation ecology.

"We use a variety of ecological research methods to study biodiversity and its ecosystem processes in natural and human-disturbed habitats, and conduct insect surveys across altitude gradients in fragmented tropical rainforests and rubber plantations to understand the impact of human disturbance on biodiversity under different climatic conditions," he told *Science and Technology Daily*.

Xishuangbanna: an ecologist's dreamland

In 2008, Nakamura graduated from Griffith University (Australia) with a Ph.D. in ecology and began field research in Yunnan province, southwestern China, as part of a collaborative research program between CAS and the government of Queensland, Australia. His research sparked curiosity about this haven of biodiversity and inspired him to accept an offer to carry out research at XTBG in 2013, located in Xishuangbanna Dai Autonomous Prefecture in the far south of Yunnan province, bordering both Myanmar and Laos.

If Xishuangbanna is an oasis on the Tropic of Cancer, then XTBG is the most dazzling gem in that oasis. This 1,125-hectare park preserves over 13,000 species of tropical plants in its 35 living



Akihiro Nakamura shows insect specimen during a lecture. (COURTESY PHOTO)

collections, including over 301 families and 2,110 genera. In the eyes of ecologists, this vast beauty holds a plethora of secrets about nature. Hundreds of researchers and students from more than 30 countries work together there to decipher nature's code. Nakamura is one of them.

Another competitive advantage of XTBG that attracted Nakamura is the adequate financial support provided by the Chinese government for advanced research with state-of-the-art facilities and the involvement of institutes such as CAS. The facilities include the canopy cranes, which are used in forested areas to access the canopy layer of trees. There are less than 20 of the cranes in the world, and half of them are in China.

"Even though I'm not working on rocket science or some other cutting-edge high-end industry, I still get support from the government. You can see

that China really cares about basic science and its commitment to protecting biodiversity," said Nakamura.

The importance of studying insects

"It's a natural reaction of people to be afraid of something they don't know, so one of my goals is to educate people about the important roles of insects that they play in the whole ecosystem," said Nakamura, noting that more than 90 percent of the insects that may exist in the world have not yet been named. He often invites elementary school students to the lab and shows them the beauty of these insects. This often sparks their curiosity and takes away the fear of bugs.

He gave the example of ants. One might be afraid of ants or find them quite annoying, but if you think about it, ants always pick up the pieces of cookies that people accidentally drop on the floor, so they pick up waste.

"That is the important ecological service role that these insects play, cleaning up the organic waste in nature," he said, adding that a study conducted in Malaysia found that more than 50 percent of the waste in the forest was cleaned up by ants.

Biodiversity doesn't stop at borders

Speaking about research work in China, Nakamura believes that international cooperation in biodiversity research is a unique advantage of XTBG. Foreign researchers and international students from more than 30 countries and regions have joined forces to provide intellectual support for the cause of biodiversity conservation.

"My team is truly international, with researchers from 10 countries, including Laos, Thailand, the Philippines, Nepal, Sri Lanka and other countries," he said, adding that international cooperation can enable researchers from different countries to share research results and provide an international perspective for ecological protection of the whole region.

A number of memoranda of understanding were signed between XTBG and other research institutes from Japan, Thailand, the Czech Republic and other regions and countries. China has also established joint border protection areas with neighboring countries in Xishuangbanna. At present, the China-Laos border area has established a green ecological corridor on the China-Laos border, covering an area of about 200,000 hectares.

"I don't think I can do my work anywhere else outside of China, as XTBG is the right choice for me," said Nakamura. In 2019, he received the Caiyun Award, established by the Yunnan provincial government to recognize foreign professionals who have made outstanding contributions to local economic and social development.

My China Story

Amigos Across Cultures

By LONG Yun & BI Weizi

Tianjin is known as the hometown of northern traditional Chinese opera, and the cradle of crosstalk, a comic and witty dialogue generally between two performers. Hence there is a saying that "Every Tianjin resident is a master of crosstalk."

At Tianjin's Nankai University (NKU), a foreign teacher is dedicated to promoting this distinctive traditional art form through performances in Spanish, fostering cultural exchange between China and other countries.

Raydis Franco, a Venezuelan teacher in the Spanish Department of the university's School of Foreign Studies, became fascinated with China and its language thanks to his high school classmate, a Venezuela-born Chinese speaker.

Hearing the melody of his friend's conversations with his family sparked a curiosity in Franco. Although he couldn't understand the language, its beauty and rhythm captivated him, igniting a strong interest in learning Chinese and eventually inspiring his journey to China for further studies.

Many years later, Franco realized that there are many hard-to-learn dialects in China. He has also realized that his friend speaks Cantonese and not the Mandarin that he has learned. He still cannot speak Cantonese well but his efforts to learn Chinese have deepened their friendship.

Franco emphasizes the differences between Spanish and Chinese: "The rise and fall of tones in Mandarin is captivating." Moreover, he finds ancient Chinese poetry beautiful and is amazed at how the poets could express such deep feelings and complex situations in just a few words. His favorite poet is 8th century Tang Dynasty poet Li Bai. To Franco, the poet stands out not only for his skill with words but also for his positive attitude towards life. Whenever Franco faces tough times, reading Li Bai's poetry gives him strength and comfort, guiding him through life's challenges.

Franco is particularly drawn to Li Bai's poems about friendship and the sense of belonging. They remind him of his own experience of being far from home and missing his loved ones.



Raydis Franco. (COURTESY PHOTO)

"Li Bai's poems often explore friendships," he said, adding that he finds the poet adept at capturing the essence of relationships.

Through Franco, his family and friends have gained new insights into China. Franco shares Chinese culture with his family through videos, teaching them basic phrases like "hello" in Chinese and showing them images of Tianjin's efficient transportation system.

Understanding the Chinese culture means exploring the customs and traditions at its core. Franco introduces his family and friends to them particularly during festivals like the Spring Festival, when he organizes parties for both his Chinese and foreign friends to celebrate together.

"We are like family here in Tianjin, celebrating festivals together and creating lasting memories," he said. Through these interactions, he, his family and his friends have gained a deeper understanding and appreciation of Chinese culture, fostering stronger bonds and connections with China.

Like many foreigners, he finds China's development remarkable. "Perhaps the Chinese people have grown accustomed to it, with advanced electronic payment systems and high-speed rail networks. But for me, all of this is simply fantastic," he said.

This article is also contributed by NKU.

4,000-Year Site Shows Evolution of Civilization

Traditional Eastern Wisdom

By ZONG Shihan

The Mopanshan site in Langxi county, Anhui province in central China, was one of China's top 10 archaeological discoveries in 2023.

The approximately 1,625-square-meter excavated area shows a well-preserved, large-scale, and culturally rich representative pre-Qin period (paleolithic period - 221 BC) culture. The site is a major discovery to understand the evolution of civilization in the lower reaches of the Yangtze River over the past 4,000 years.

The artifacts unearthed at the

Mopanshan site indicate that the local residents enjoyed a prosperous lifestyle. The numerous net-sinking and ceramic weaving tools suggest a developed fishing economy. Most of the stone tools show signs of use, indicating that handicrafts and agriculture employing stone tools were relatively advanced. Their fishing-based economy was supplemented by farming, herding, gathering, and hunting.

A considerable number of jade artifacts were also excavated, including jade rings, pendants, beads and buttons. Many of these objects were reused, with fragmented jade pieces drilled and strung together, indicating jade may have been regarded as a precious item.

Archaeologists also discovered some unique artifacts, such as fish-, pig- and cattle-shaped vessels. These

biomimetic artifacts reflect the lifestyle and aesthetic preferences of the ancient residents.



The fish-shaped, cattle-shaped, and pig-shaped vessels unearthed from the Mopanshan site, Anhui province. (PHOTO: XINHUA)

Staying Hydrated with Healthy Soup in Summer

Science Outreach

By Staff Reporters

As the temperature rises, the amount of sweat produced by the human body increases, from imperceptible perspiration to perceptible sweating. The water lost through sweat needs to be replenished through food and drinks. Liquid replenishment includes beverages such as water and tea, as well as soup. So, why should we not only drink water but also eat soup?

Because the retention time of water in the body is relatively short, it is quickly absorbed and then expelled. However, in soup that contains solutes, part of the water is bound by the solutes, prolonging its retention time in the body. Especially for soups containing starch or soluble dietary fiber, part of the water can reach the small intestine or even the large intestine, further extending its retention time in the body.

Moreover, the sweat produced in summer is not pure water. Along with the sweat, sodium, potassium, calcium, magnesium, B vitamins, and a small amount of nitrogen-containing substances such as protein, ami-

no acids, and urea are also lost. The solute components in the soup can, to a certain extent, help replenish the nutritional components lost through sweating.

Therefore, eating soup not only replenishes water, but also some water-soluble nutrients derived from natural ingredients. However, whether eating soup brings health benefits depends on whether the soup is cooked properly. Eating the right soup is beneficial to health, while the wrong soup may lead to weight gain and high blood pressure.

To make a tasty soup, the heating speed should be slow enough to maintain the close combination of protein

ingredients and water molecules, avoiding rapid denaturation and aggregation of proteins, which can affect the dissolution of soluble components.

If you want to enjoy a clear soup made with chicken, duck, fish, meat, or mushroom, the best way is to steam it over water. This allows the flavor components and mushroom polysaccharides in the meat and mushrooms to slowly dissolve under conditions below boiling point, making it easy to remove the floating oil and resulting in a particularly refreshing and fragrant soup. In addition, soup can also be cooked in clay pots or ceramic pots. Just add a very small amount of salt to fully enjoy the delicious taste.

New Tech Transforms Manufacturing Industry

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The recent upgrade and optimization of the Rizhao Port in Shandong province, east China, is a vivid example of this transformation. Technological innovation has transformed the deep-water port from a traditional one into a modern one.

"Rizhao Port has constructed a shore-based, fully automated container terminal, integrating technologies like 5G, BeiDou and AI. It has introduced six industry-leading technological achievements, such as a domestically developed unmanned container truck scheduling system, achieving a true transformation from 'manned' to 'unmanned' operations and from traditional bulk cargo terminals to automated container terminals. This has increased single-machine efficiency by 50 percent, reduced overall costs by 70 percent, and cut annual carbon emissions by over 9,000 tons," explained Zhang Liangang, a senior expert at the Shandong Port Group Co., which operates the port.

Zhang said automated terminal construction primarily involves two methods: building new automated terminals and upgrading traditional ones, with the latter being more cost-effective and quicker to construct, providing a Chinese solution for the global transformation of traditional terminals into fully automated container terminals.

Data shows that by the end of 2023, China had over 400 national-level demonstration factories and over 10,000 provincial-level digital workshops and

intelligent factories. Digital technology is empowering new industrialization with its broad industry coverage, strong business penetration, high intelligence level, and significant economic benefits.

Upgrading green growth with technology

Green development is an inherent requirement of new quality productive forces and the cornerstone of high quality development, according to Shi Jianxun, deputy director of the National Institute of Innovation and Development at Tongji University in Shanghai.

Green development is a key focus at the Rizhao Port. The Shijiu Port, part of the Rizhao Port, uses environmental protection equipment linked by Internet of Things (IoT) technology to monitor dust concentration in real-time and enable intelligent spraying of the storage yard. This contributes to a full-process intelligent environmental protection control system and promotes environmental management transformation.

Three systems operate online simultaneously at the port container terminal: an intelligent control system, a production business management system, and a supply chain service platform. The launch of an e-container business mode on the Cloud Port platform marks a nationally produced and fully independent container core production system, a first for the port. After going online, the wharf's operation efficiency has increased by 23 percent and sluice clearance efficiency by 30 percent.