

Introduction and cultivation of *Plukenetia volubilis* Linneo

CAS President LU Yongxiang brought some seeds of *Plukenetia volubilis* Linneo from Peru to XTBG in 2006. Through field experimentation, XTBG has successfully grown *Plukenetia volubilis* Linneo in Xishaungbanna in the field plots.

Plukenetia volubilis Linneo is a plant native to Peruvian Amazon region. Scientific studies indicate that it is the best oil plant because of its composition and high nutrition quality.



Flowering plants of *Plukenetia volubilis* Linneo



Seedlings of *Plukenetia volubilis* Linneo



Fruits of *Plukenetia volubilis* Linneo



Checklist of seed plants of Ailao Mountain compiled

Headed by Prof. ZHU Hua, the XTBG Herbarium underwent the task of compiling the Checklist of Seed Plants of Ailao Mountain. After two-year hard work, a fairly complete manuscript has been recently completed for specialists and colleagues to review.

Ailao Mountain National Nature Reserve is located in 23°36' ~ 24°56'N and 100°44' ~ 101°30'E, Southern Yunnan, SW China, with an area of 677 km². It represents the largest montane evergreen broad-leaved forest in subtropical China.

The Checklist of Seed Plants of Ailao Mountain catalogs 945 plant genera in 199 families, including 2238 species and 215 varieties (and subspecies). It provides the plant names, cited specimens, collection places and information on the distribution of all species in individual areas, their abundance and habitat demands.



Inside view of montane evergreen broad leaved forest in Ailao Mt.

Every taxon listed is documented with a herbarium specimen that is deposited and accessioned in XTBG Herbarium. Complete specimen documentation is available.



Physiognomy of montane evergreen broad leaved forest in Ailao Mt.

Study on urban climate in Kunming city, Yunnan, China

The urban influence on air temperature, in most mid-latitude cities, appears as warming. The potential attribution of the heat island effect to the global warming effect on environment might be much more distinguishable, and cannot be ignored.

The study on urban climate in Kunming city, Yunnan, China was awarded the 2nd prize of Science & Technology Progress of Yunnan Province.

Using the vertical measurement data of urban and suburb in Kunming city which located at low latitude plateau, Prof. ZHANG Yiping and his team analyzed the characteristics of spatial-temporal distribution of city climate in Kunming. Through comparing analyses, they found that urban heat island lie in not only near the ground but also upper atmosphere. In urban area, the air temperature decrease with height increasing in daytime and temperature at night is inversion distribution, the center of urban heat island shifts with height increasing.

ZHANG found that external surface temperature and nearby air temperature show the differences that exist in the various orientations, heights and the notable seasonal variations. In urban area the roof surface was the second thermal active surface, which is different from the ground.



Certificate of Award

Facts:

In the year 2008, XTBG scientists have achieved the following:

- 76 research papers/articles published on internationally peer-reviewed scientific journals (Source Journals of ISI Web of Science);
- 87 research papers/articles published on CSCD (Chinese Science Citation Database) referred journals;
- 24 research papers/presentations presented on international conferences and symposia;
- 7 monographs published;
- 8 patented inventions.



Improvement of research facility

New research center well under construction

Located at the east part of XTBG, the new research center (13133.13 m²) will host three main buildings used for research centers, laboratories, and library.

To be completed in 2009, the 26.38 million Yuan (about \$3.86 million) facility is jointly funded by XTBG and National Development and Reform Commission (NDRC). The entire research complex was designed by the French architect Alain HAYS and his XTBG team.



Opening ceremony of the new research center



Ground-breaking ceremony of the new research center



Twenty-four world's leading scientists inspecting the construction site



A bird's-eye view of the constructing new research center



Participants of the first academic symposium of the CAS key lab of tropical forest ecology

CAS approves to set up Key Laboratory of Tropical Forest Ecology in XTBG

In September, the Chinese Academy of Sciences sent an on-site evaluation expert committee to review XTBG's Laboratory for Tropical Rain Forest Ecosystem Research and Management (TRERM) that was created in 1998 and became operational since 2003. After 5 years operation, the laboratory has made expected achievements. After hearing the general report by Dr. CAO Min, the evaluation committee inspected laboratories and field facilities, and concluded to propose the laboratory as a Key Laboratory of CAS, and suggested the rename it as "Key Laboratory of Tropical Forest Ecology".

After final-round evaluation, CAS approved the proposal made by on-site evaluation expert committee and coded the **Key Laboratory of Tropical Forest Ecology** as 2008DP173384.



Dr. CAO Min presenting Key Lab report to on-site evaluation expert committee



The unveiling of the CAS key lab plaque on the opening ceremony



China's largest tropical rainforest dynamics plot established in Xishuangbanna

A 20-ha tropical rainforest dynamics plot, located in Xishuangbanna has been jointly established by XTBG and the Xishuangbanna National Nature Reserve (XNNR) Administration. The plot is the largest of its kind in China.

Initiated in 2006, this project was co-funded by the CAS Biodiversity Committee and XTBG, it is meant to monitor and study the long-term dynamics of the tropical rainforest ecosystems. With the work of crew from both XTBG and the XNNR offices, census of all plants in the plot was completed in 2008.

Follow the criteria set by the Center for Tropical Forest Science (CTFS), researchers found out that 468 species of trees, including 95,843 individuals with $DBH \geq 1\text{cm}$. The data regarding this plot was published by Yunnan Science & Technology Press.



One of the subplot marking stakes in the plot

Six-ha subtropical forest dynamics plot established in Ailaoshan

A 6-ha permanent plot for subtropical forest dynamics and plant species survey was launched in Ailao Mountain National Nature Reserve by XTBG. With accurate positioning, topographical measurement and complete species field survey, the construction of the plot is in smooth development. The arrangement of one hundred fifty 20m x 20m plots has been primarily finished in the forest. The plants labeling, species identification, measurement of diameters at breast height, height determining and tree positioning have been finished. The first census made it clear that there are 12,335 individuals with $DBH \geq 1cm$, belonging to over 50 species. The field survey was undertaken by XTBG, in collaboration with Jingdong Nature Reserve Administration.

The functions of the plot are for investigating plant ecological resources, identifying trees with $DBH \geq 1cm$, determining diameters at breast height (DBH), positioning trees, and mapping tree distribution patterns, etc. By using the scientific facilities of XTBG Ailaoshan



Inside view of 6-ha subtropical forest dynamics plot

Station and well-preserved natural subtropical forest, the plot is expected to provide a better platform for the long-term studies of the structure, function and dynamics of subtropical forest ecosystem in Southwestern China.



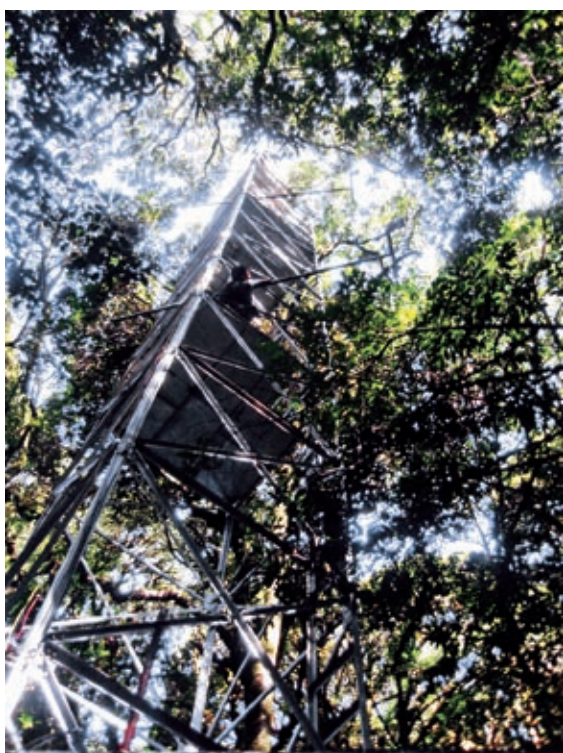


Chinese Terrestrial Ecosystem Flux Research Network sets up observation system in subtropical montane evergreen broad-leaved forest

A 30 m high observation tower for subtropical montane evergreen broad-leaved forest was set up in Ailaoshan National Nature Reserve by XTBG, located at 24°32'17"N, 101°01'44"E, 2505m a s l. Seven levels of RMET system and one level of OPEC system are fixed on the tower at different platforms. Meanwhile, chamber measurement system is also installed. The typical vegetation in the Ailaoshan National Nature Reserve is represented by subtropical montane evergreen broad-leaved forest with a canopy height of 23m.



Seven-level wind speed, temperature and humid microclimate vertical observatory system and 6-level pole PAR observatory system



The 30m high flux observation tower



Physiognomy of subtropical montane evergreen broad leaved forest and the 30m high flux observation tower in Ailao Mt.

CO₂ phytotrons established at Ailaoshan Station

A set of CO₂ phytotrons were set up by Prof. FENG Yulong's group in Ailaoshan Station, which include four plant growth greenhouse chambers and a laboratory. It is aimed at carrying out a new control-and-test approach by integrating bio-invasion ecology with the on-going global warming, exploring the evolution of the aggressiveness developed in the intruding floral species against a complete set of changed ecological conditions as result of the global warming (such as the increased content of CO₂ in the air, the current temperature hike, subsidence of nitrogen and its compounds, etc.) in addition to the prediction of the possible distributive layout of the alien species, the early warning of the changes, identification of the weak links and restrictive factors in the dissipative process of the intruding species. Based on these, related

countermeasures are to be formulated in a bid to stop their propagation and develop new methods of scientific management for their control and prevention. By using the phytotron, scientists can predict the possible distribution of invaded plant species, discover the vulnerable spots and limiting factors, and make an early warning,



The CO₂ phytotrons



XTBG allocates 64 ha land for controlled ecological experiments and to demonstrate techniques in tropical vegetation restoration

The escalating economic growth and impacts of human activities have resulted in the tremendous changes of natural ecosystems. It has become an important mission for long-term ecological studies to understand response mechanisms of ecosystems to global change at multiple scales. Ecological modeling experiment based on artificial control seems to be an effective option. XTBG has set up a 64-hectare experiment base, within the garden, for controlled ecological experiments and to demonstrate techniques in tropical vegetation restoration.



Satellite image of the 64-hectare experiment base

XTBG and Simao Teachers' College to co-construct a new teaching building

As representatives of the two sides, Prof. CHEN Jin, director of XTBG and Ms. DU Wei, president of Simao Teachers' College, signed an agreement on February 22 between XTBG and SMTC to jointly construct a comprehensive building. Located in the residential area of XTBG, the building covers a total site area of 500 m² and construction area of 2000 m². SMTC is responsible for the construction fund. XTBG and SMTC have been keeping on good ties with each other for many years. The two sides had jointly established a "Personnel Training Base for Tropical Horticulture" in XTBG since 2001.

Conferences and symposia

Training Workshop on spatial analysis in macroecology

Aimed at helping researchers and graduate students to learn about spatial analysis and master the application of spatial analysis in macroecology (SAM) software, XTBG organized a workshop during November 24-28. Mr. Thiago Fernando RANGEL, a doctoral candidate from the University of Connecticut, was invited as the instructor. The 5-day workshop was undergoing in an interactive atmosphere, bringing together 30 trainees from XTBG, KIB, KIZ and other institutions. The workshop covered 3 full days of lectures including practical application of SAM software.

The participants got a general understanding about the computational tool, had practical spatial analysis, and held discussions around different techniques and applications developed during the workshop.



Mr. Thiago Fernando RANGEL delivering lecture



Conference hall



Second conference on biodiversity conservation and nature reserve management

The 2nd conference on biodiversity conservation and nature reserve management, jointly sponsored by Ecological Society of China and Research Center for Nature Reserves of State Forestry Administration, was held in Kunming during May 12-15. The conference was undertaken by the Ecological Society of Yunnan.

With the theme of “Biodiversity conservation and nature reserve management meeting climate change”, the conference brought together over 60 scholars and interested decision makers. On behalf of sponsoring units and undertaking unit respectively, Prof. LIU Shirong, and Prof. CHEN Jin addressed the conference. Six experts, including Prof. LIU Shirong, Prof. LEI Chunguang, Prof. CHEN Jin and Prof. OUYANG Zhiyun, were invited as keynote speakers. In a lively and active atmosphere, the participants agreed that biodiversity conservation and construction & management of nature reserves are important components for ecological studies. It is significant to find proper ways and models for nature reserve management.



Conference hall



Prof. CHEN Jin delivering a lecture

Preparation of International Symposium and International Consultation

During special occasion of XTBG's 50 anniversary, the "2nd Xishuangbanna International Symposium: Biodiversity Conservation: Research imperatives for scientific institutions" has been planned for January 1-2, 2009, 120 delegates (24 from overseas) from 16 countries were invited to participate, the symposium features 12 invited presentations on the theme. After the symposium, an International Consultation is planned on January 3, 2009. A consultation report with analysis and recommendations will be expected from the expert committee with 18 members from 10 countries.

Other workshops

Chinese Botanical Gardens Conference & Academic Meeting 2008

The Chinese Botanical Gardens Conference & Academic Meeting 2008 was held in Guiyang, Guizhou Province during October 15-19. Approximately 220 invitees attended, representing botanical gardens nationwide, including Taiwan and Hong Kong. Prof. CHEN Jin, director of XTBG, headed up a 9-person group to present at the conference. The conference was themed around conserving plant diversity, botanical gardens and the practice of conservation, public education, sustainable development, etc. 5 XTBG participants made presentations. Prof. CHEN Jin's presentation was entitled "Evaluation on the ex situ conservation of endemic plant species in Chinese botanical gardens". Prof. XU Zaifu presented "Return: restitution in nature of *ex situ* ((restoration of plants to natural environment)" to the attendees. The two lectures aroused interest and positive response among the participants. The Guizhou Declaration was released from the meeting.

BGCI China Programme Workshop

On February 26, the press conference of China's Strategy for Plant Conservation was held at South China Botanical Garden, CAS. After official release of the book (both Chinese and English versions), the BGCI's China Programme Office was unveiled. Following those ceremonies was the BGCI China Programme Workshop. Among the 18 invited speakers, Prof. CHEN Jin presented "The Role of Botanic Gardens in in situ Conservation of Local Biodiversity: The case of Xishuangbanna Botanic Garden" at the Workshop. Dr. HU Huabin & HU Jianxiang also participated in the Workshop on invitation.

75th Anniversary Annual Meeting of BSC

On the occasion of its 75th anniversary, the Botanical Society of China (BSC) held its 14th plenary conference & 75th annual meeting in Lanzhou, Gangsu Province from July 13 to 15. Prof. CAO Min, deputy director of XTBG, headed up a 14-person group to actively participate in the academic meeting. The meeting brought together over 800 representatives from universities and research institutions worldwide. XTBG participants made presentations at different sessions. Prof. CHEN Jin was elected as a member of the new Board of Botanical Society of China.



75th Asia Flux International Workshop

Entitled “Re-thinking global change science: from knowledge to policy”, the 7th AsiaFlux International Workshop was held in Seoul, Korea during November 17-19, celebrating the 10th anniversary of the AsiaFlux. The International Workshop brought together more than 100 participants from China, Australia, Japan, USA, Thailand, UK, France and India. Prof. ZHANG Yiping and Dr. SHA Liqing of XTBG participated in the Workshop. They made oral presentations with the title of “Characteristics and effects of ‘carbon lake’ in the tropical mountainous region of Xishuangbanna, SW China” and “Fluxes of CH₄, N₂O and CO₂ from paddy soil with different nitrogen application in Xishuangbanna, SW China” respectively. During the sessions, they exchanged ideas with Dr. Kasemsap of Kasetsart University, Thailand and Dr. Thaler of France on carbon sinks in rubber forests. They also discussed cooperation potentials in flux studies.



Conference hall

Carbon and Communities in Tropical Woodlands Conference

Prof. ZHANG Yiping and Dr. SHA Liqing participated in the “Carbon and Communities in Tropical Woodlands” Conference – An international interdisciplinary conference June 16-18 in Edinburgh. They separately submitted posters entitled “Characteristics of carbon sources/sink effect and its causes of a tropical seasonal rain forest in Xishuangbanna, Yunnan, SW China” and “The carbon sequestration by rubber tree plantation in Xishuangbanna, Yunnan, SW China”. The meeting brought together experts in tropical woodland ecology, carbon sequestration projects, policy makers and investor to discuss current issues and share knowledge. Issues of risk, permanence, governance and methodologies for carbon sink analysis were covered. On invitation, Prof. ZHANG and Dr. SHA visited monitoring station of the University of Edinburgh. They exchanged ideas with Prof. John GRACE on joint research and talents training, etc. They also visited Royal Botanical Gardens, Edinburgh and Kew.



Prof. ZHANG Yiping(left), Prof. John GRACE (middle) and Dr. SHA Liqing(right) meet in the University of Edinburgh

IFAW eco-photography training camp

Sponsored by the International Fund for Animal Welfare (IFAW) and Wild China Film, the Eco-photography Training Camp and China Wildlife Photography Training Camp in Xishuangbanna was held during May 1-5, 2009, with assistance of XTBG, Xishuangbanna National Nature Reserve Administration, Ecological Society of Yunnan, and Xishuangbanna Photographers Association.

The Training Camp has invited Mr. XI Zhinong, a well-known wildlife photographer, and Mr. XU Renxiu, chairman of Taiwan Wilderness Association, as major lecturers. 50 professional and amateur photographers, from Beijing, Shanghai, Taiwan, Kunming, Xinhua News Agency, and Beijing Daily, took part in the



Field visit

training course.

China has rich biodiversity in the world. However, images of some rare endangered species are relatively lacked. While improving the level of ecological photographing, the photographers are to contribute to environmental protection through the power of images.



Participants of IFAW eco-photography training camp



Prof. CHEN Jin delivering a speech on the Opening Ceremony of the 2nd annual meeting of ATBC Asia-Pacific chapter

The 2nd annual meeting of ATBC Asia-Pacific chapter

The Association for Tropical Biology & Conservation (ATBC) Asia-Pacific chapter held a successful second annual meeting at Kuching, Sarawak in April 23-26, 2008 under the theme of sustainable land-use in the region. Approximately 200 participants attended the meeting and gave approximately 130 oral presentations and 45 posters. The meeting was hosted by the Sarawak Forestry Corporation and held in association with the Japanese Society for Tropical Ecology.

The founding president of ATBC Asia-Pacific chapter, Prof. CHEN Jin and 9 XTBG scholars attended the meeting. Prof. CHEN also delivered a speech on the Opening Ceremony. XTBG scholars made thematic reports at the meeting.

In 2006 the ATBC launched an Asia-Pacific Chapter to help promote tropical biology and conservation in the region. The chapter held a very successful inaugural conference in March 2007 at Mahabalipuram, India and continues to hold annual regional meetings.

Biomathematics course

A Biomathematics course was held during August 18-29, 2009 in XTBG. Prof. XU Kexue, from Institute of Botany, Chinese Academy of Sciences, was invited as the instructor. The course covered 11 evenings of lectures including multivariate statistics, phenetic classification, and KX Biomathematics software developed by Prof. XU.

HORTICULTURE

A vibrant garden scene featuring a paved path that curves through a lush landscape. In the foreground, there is a dense bed of bright red flowers with green foliage. To the left, a small pond is visible, surrounded by several tall palm trees. The background is filled with a variety of green trees and shrubs, creating a dense forest-like atmosphere. The sky is filled with soft, white clouds, suggesting an overcast day.