

# Participation to the meeting of Acid Rain 2011 at Beijing

The 8th International Conference on Acid Deposition  
**ACID RAIN 2011**



## **8. Beijing China 2011**

1. Columbus **USA** 1975 2. Sandefjord **Norway** 1980 3. Muskoka **Canada** 1985  
4. Glasgow **UK** 1990 5. Göteborg **Sweden** 1995 6. Tsukuba **Japan** 2000  
7. Prague **Czech Rep** 2005

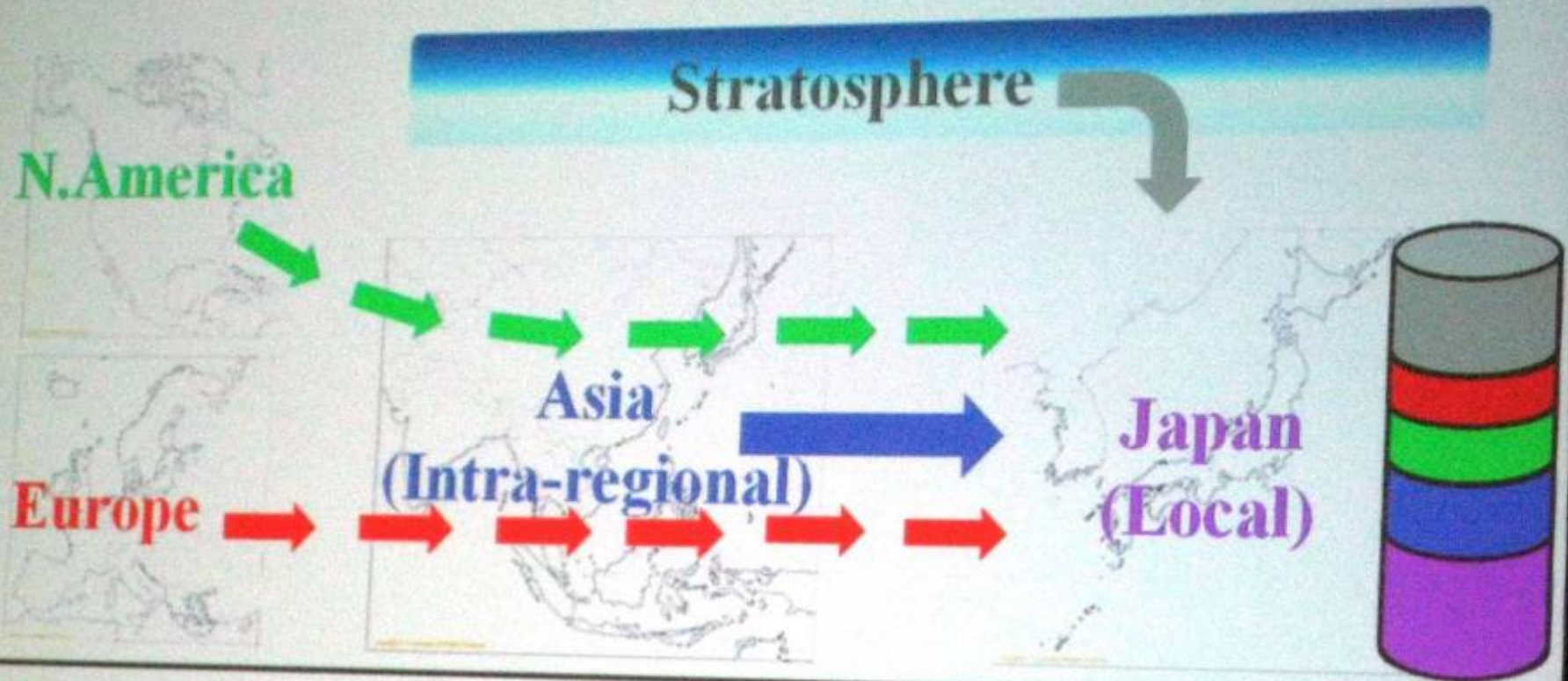
# Contents

1. Conference center and “atmosphere”
2. Visit to The center of Eco-Environment,  
Chinese Academy of Science  
(OG, Dr. Qu Laiye : 曲来叶博士)
3. Visit to the study site of Stalinization soil  
by Prof. Shi FICHE (石福臣教授)
4. The Peking Office of Hokusai
5. Foods



In front of the conference center guite

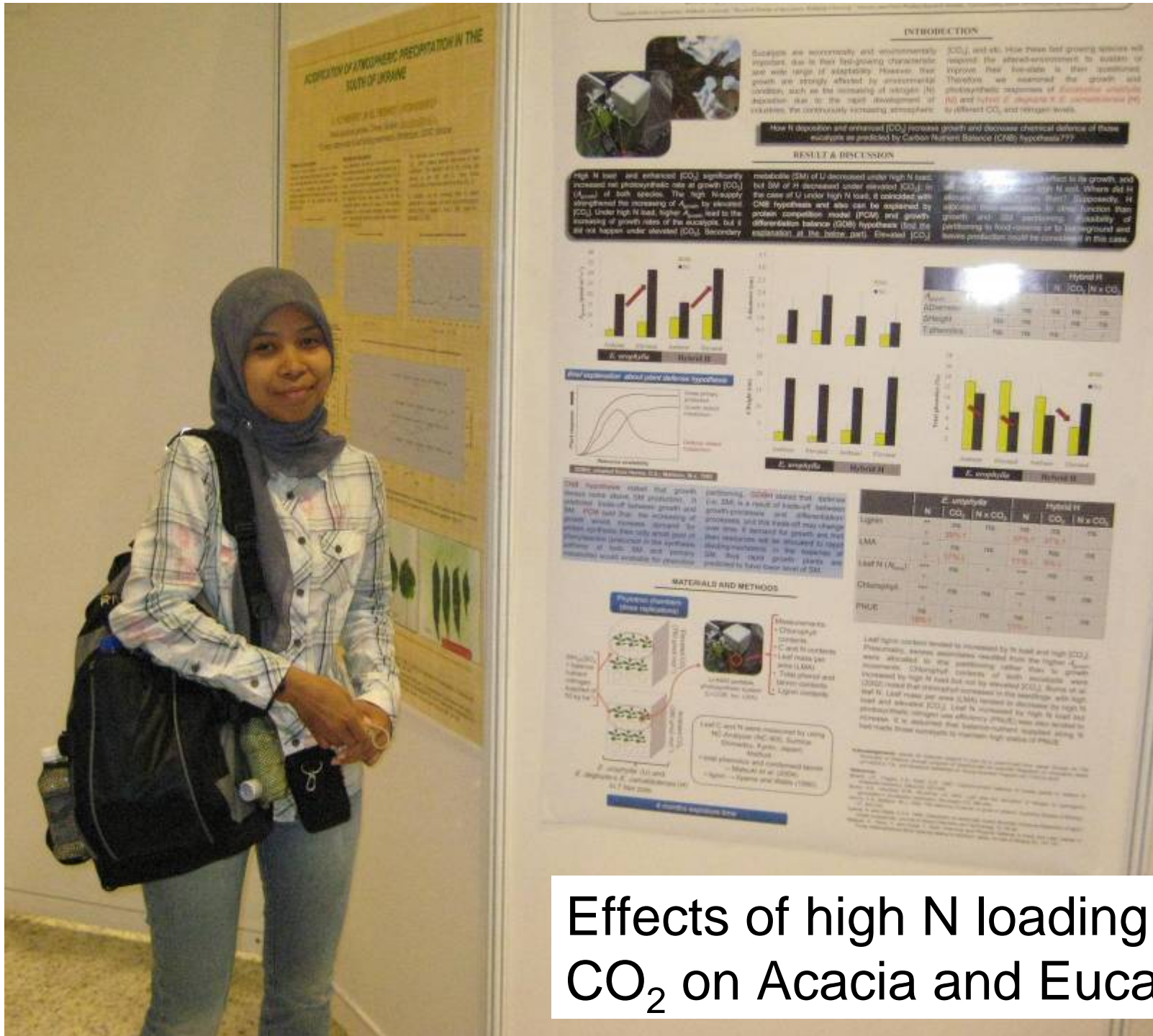
# Contribution of various source regions on O<sub>3</sub> in Japan



How much does Japan receive O<sub>3</sub> from each source region?

Source-Receptor (S-R) relationship

Estimated by using numerical model



# ACCIPIATION OF ATMOHERIC PRECIPITATION IN THE SOUTH OF URBANE

A STUDY ON THE IMPACT OF HIGH N AND HIGH CO2 ON THE GROWTH OF ACACIA AND EUCALYPTUS



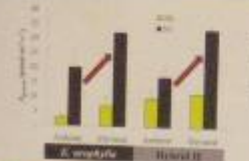
## INTRODUCTION

Eucalyptus are economically and environmentally important due to their fast-growing characteristic and wide range of adaptability. However, their growth are strongly affected by environmental conditions, such as the increasing of nitrogen (N) deposition due to the rapid development of vehicles, the continuously increasing atmosphere CO2, and etc. How these fast growing species will respond the altered-environment to sustain or improve their live-state is their question. Therefore, we examined the growth and photosynthetic responses of *Acacia saligna* (A) and *Eucalyptus globulus* (E) under elevated CO2 and nitrogen levels.

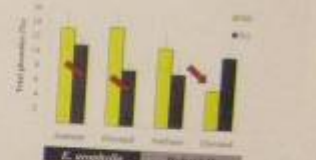
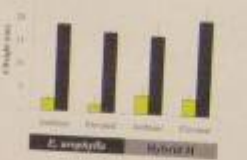
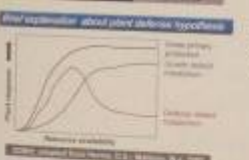
High N deposition and enhanced CO2 increase growth and decrease chemical defense of those eucalyptus as predicted by Carbon Nutrient Balance (CNB) hypothesis???

## RESULT & DISCUSSION

High N level and enhanced CO2 significantly increased net photosynthetic rate at growth CO2 (A<sub>net</sub>) of both species. The high N supply strengthened the increasing of A<sub>net</sub> by elevated CO2. Under high N load, higher A<sub>net</sub> lead to the increasing of growth rates of the eucalyptus, but it did not happen under elevated CO2. Secondary metabolite (SM) of E decreased under high N load, but SM of A decreased under elevated CO2. In the case of E under high N load, it coincided with CNB hypothesis and also can be explained by protein competition model (PCM) and growth-differentiation balance (GDB) hypothesis (and the explanation at the bottom part). Elevated CO2 affected its growth and photosynthesis under high N load, where did it also affect its secondary metabolite? Supposedly, if eucalyptus more susceptible to other function than growth and SM, maintaining availability of performing in high-nitrogen or in background and leave production could be considered in this case.



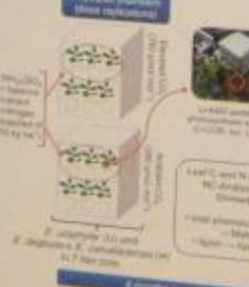
	Hybrid H			
	N	CO <sub>2</sub>	N x CO <sub>2</sub>	CO <sub>2</sub>
A <sub>net</sub>	100	100	100	100
Chlorophyll	100	100	100	100
Secondary Metabolite	100	100	100	100



Our hypothesis stated that growth rates would decline 10% production, in relation to the increase of growth and SM. PCM said that the increasing of growth would increase demand for photosynthetic rate. The only small part of photosynthesis (measured in the experiment of high-N and primary metabolite would be available for photosynthesis.

Furthermore, GDB stated that relative growth rate (RGR) is a result of a balance between growth potential and differentiating processes, and this state of may change over time. It decreased for growth and that this reduction will be observed by rapid dividing-metabolism in the presence of SM. High N load growth rates are predicted by favor lower level of SM.

## MATERIALS AND METHODS



Measurements: Chlorophyll content, C and N contents, Leaf mass per area (LMA), Total phenol and Lignin contents.

Leaf C and N were measured by using N/A Analyser (EA 1112, Sumner Chemical, Kyoto, Japan) using Method: Elemental analysis and combustion (EA) - Manual and EA (EA) - Rapid - Flame and Nitro (EA) - EA 1112.

Leaf lignin contents were measured by the acid-soluble lignin (ASL) method. The lignin contents were extracted from the lignin after the lignin was extracted by the lignin extraction method. The lignin contents were measured by the lignin extraction method. The lignin contents were measured by the lignin extraction method.

	E. saligna				Hybrid H			
	N	CO <sub>2</sub>	N x CO <sub>2</sub>	CO <sub>2</sub>	N	CO <sub>2</sub>	N x CO <sub>2</sub>	CO <sub>2</sub>
Lignin	100	100	100	100	100	100	100	100
LMA	100	100	100	100	100	100	100	100
Leaf N (g m <sup>-2</sup> )	100	100	100	100	100	100	100	100
Chlorophyll	100	100	100	100	100	100	100	100
PHUE	100	100	100	100	100	100	100	100

Effects of high N loading and CO<sub>2</sub> on Acacia and Eucalypts



Dr. Yamashita

Prof. K. Satake

Serpentine regions frequently experience erosion and landslides.

Hybrid larch  $F_1$   
 (*Larix gmelinii* var. *japonica* × *L. kaempferi*)  
 Important species not only for timber production and carbon sink, but also for afforestation in severe conditions.

**How about the ability of Hybrid larch  $F_1$  as afforestation material in serpentine soil?**

Increase of N deposition  
 Although N usually acts as fertilizer, the main factor for tree growth in serpentine soil may not be N deficiency.

**Does increase of N deposition enhance the growth of hybrid larch  $F_1$  grown on serpentine soil?**

## 2. Materials and Methods

Experimental site  
 Teshio Exp. Forest (Hokkaido Univ.)

Experimental Period  
 May 2007 to September 2009

Plant material  
 One-year-old Hybrid larch  $F_1$

Soil conditions  
 Serpentine soil (S)  
 Brown forest soil (B)

N treatment  
 0 (-N) and 47 kg N ha<sup>-1</sup> year<sup>-1</sup> (+N)  
 N load with (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> was started from May 2008

Measurements  
 Photosynthetic traits (July 2009)  
 • Analysis of A-Ci curve  
 Light-saturated net photosynthetic rate ( $A_{max}$ )  
 Stomatal limitation of photosynthesis  
 Maximum rate of carboxylation ( $V_{cmax}$ )  
 Maximum rate of electron transport ( $J_{max}$ )

Needle traits  
 • Leaf mass per area (LMA, g m<sup>-2</sup>)  
 • Needle element contents (N, P, K, Mg, Ca, Ni)

Height and diameter growth of stem  
 Dry mass of each organ (September 2009)



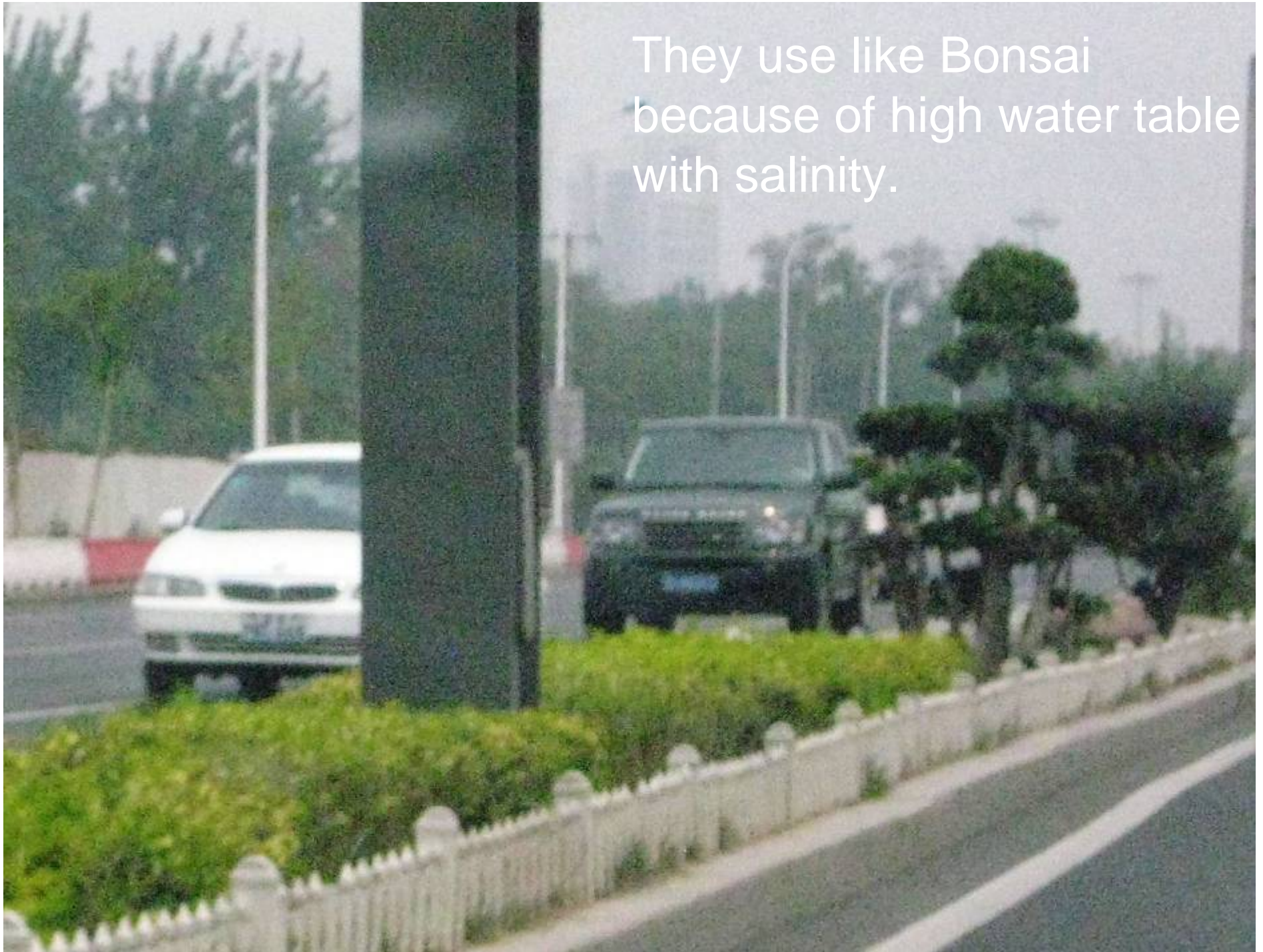
The Center for  
Eco-Environment,  
Chinese Academy of  
Science (CAS)

**Dr. Qu Laiye**

Associate professor,  
She got several prizes:

- 1) 1<sup>st</sup> CSC scholarship  
(Total 96 in the world)
- 2) Sapporo Agriculture  
scholarship
- 3) IUFRO best  
presentation at Au.

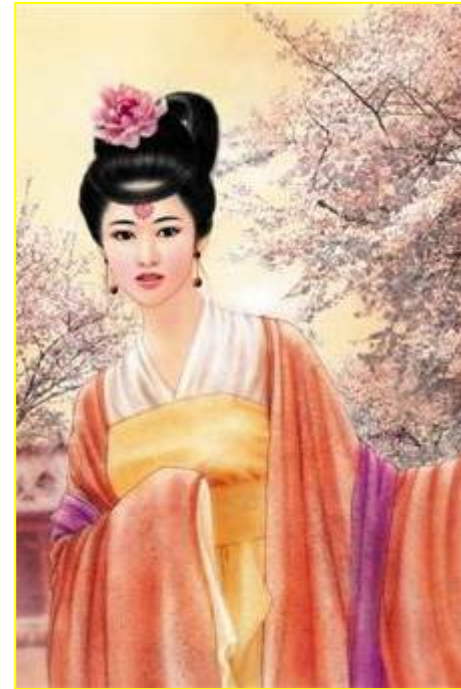
They use like Bonsai  
because of high water table  
with salinity.







*Tamarix chinensis*  
ギョリュウ・御柳  
楊貴妃の愛した樹木



塩性土壌の緑化に  
注目！



With vice director  
Mr. Park



[http://hokudai.cn/japanese/news\\_y83.html](http://hokudai.cn/japanese/news_y83.html)



Famous Chinese foods  
With Miso soup of 吉野屋！