

# Ginkgo Cultivation in China With Reference to Varietal Taxonomy



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# Outline

- Introduction to *Ginkgo biloba*
- Production & utilization
- Genetic improvement
- Varietal taxonomy
- Research collaboration
- Conclusion

## ***Ginkgo biloba* is:**

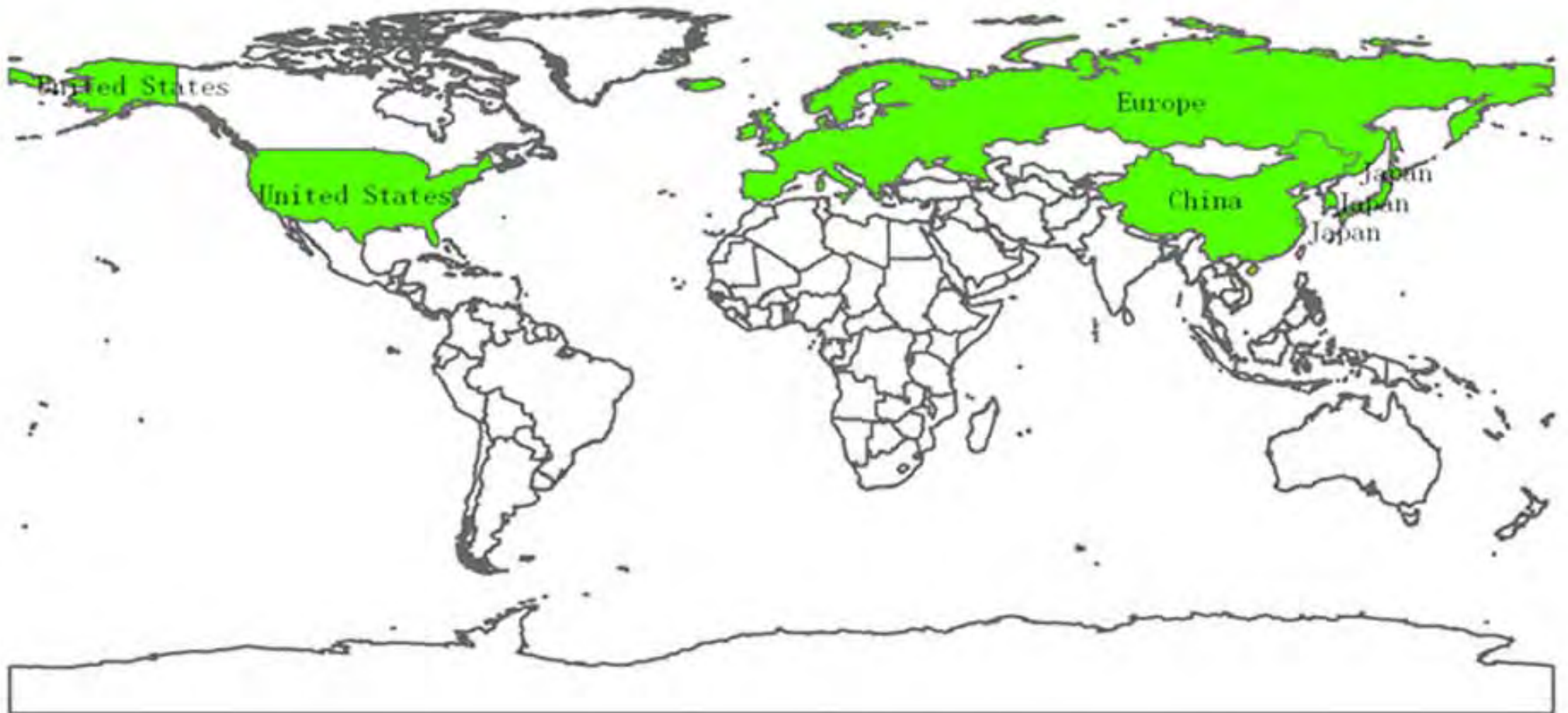
- Endemic to China
- Naturally from 22-42<sup>0</sup>N
- Growing in pH 4.0-8.5
- January mean temperature  
≥ -15<sup>0</sup>C but ≤ 13<sup>0</sup>C
- An epibiotic 'living fossil' plant



# Ginkgo biloba Distribution In China



## *Ginkgo biloba* Distribution Around The World



Colored area represents countries or regions where the *Ginkgo biloba* is planted

**> 3000 years old**



**Villages, schools,  
temples, etc.**

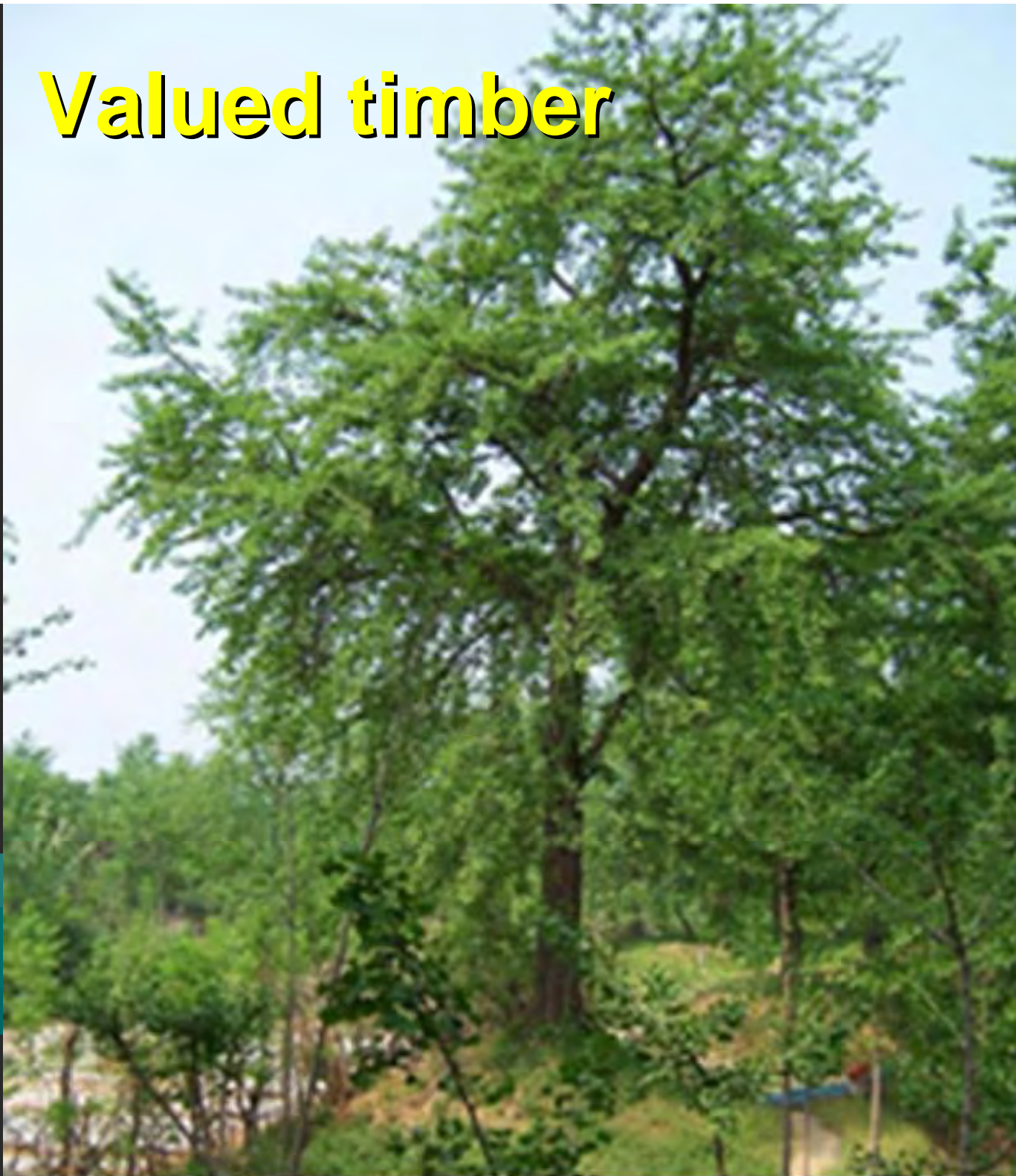
# Production status (China)

- Production centers: Eastern & Central China
- 12 Provinces & 60 counties
- More than 200 million productive trees
- Occupied 180 000 ha
- Nut 30 000 tons/yr, leaf yield 20 000 tons.
- Valued 2.6 billion *yuan*/yr (US\$340 million).

# Production status (World)

- **Distribution: > 50 countries**
- **>210 million productive trees**
- **Occupied 200,000 ha**
- **Nut 30,050 ton/yr; leaf 28,600 tons.**
- **Valued US\$2 billion/yr.**

# Valued timber





***Ginkgo biloba*: a popular landscape tree**



EGB

Containing flavone  
with function curing  
vascular diseases

Ginkgo  
tea



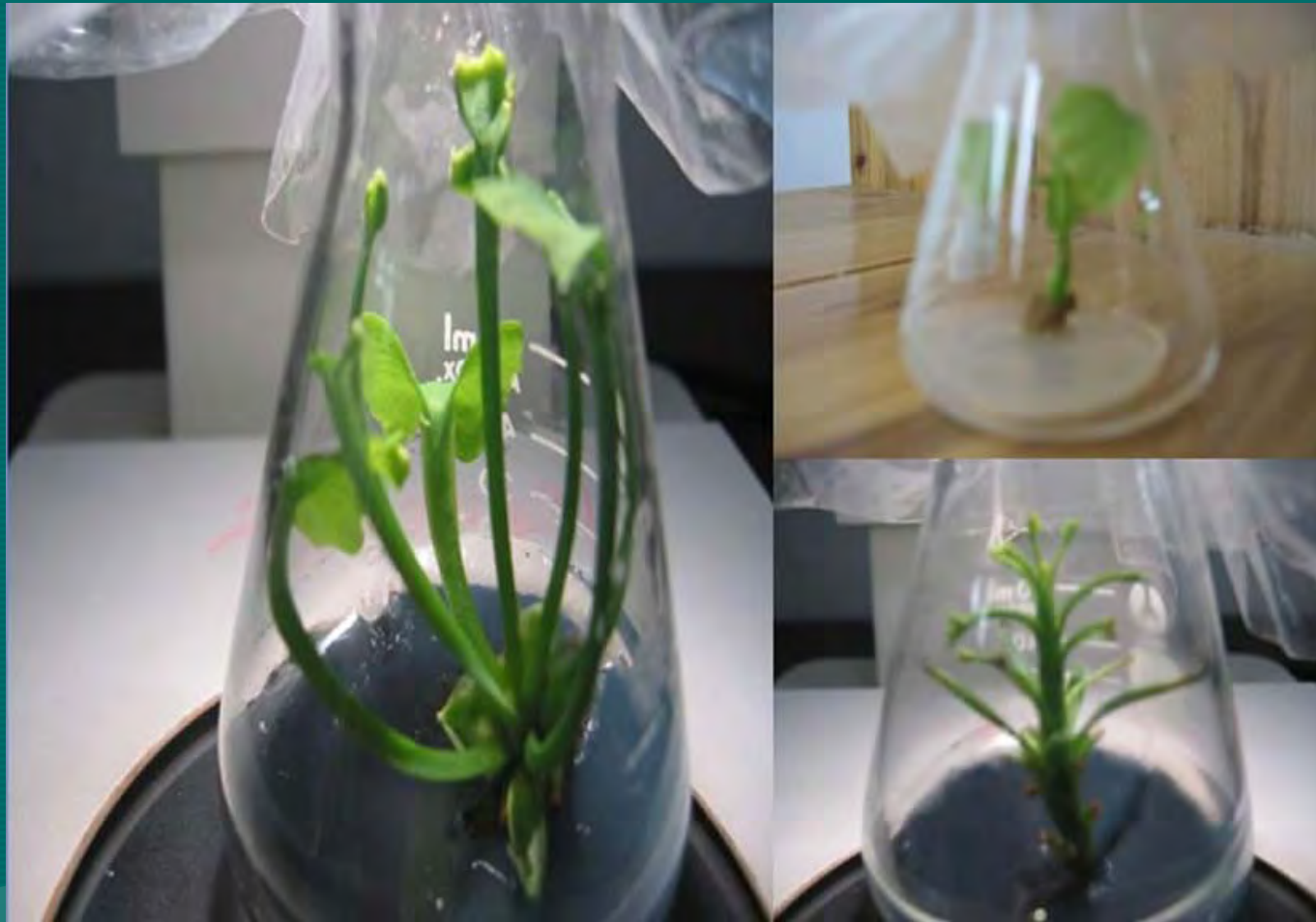
Medicine

# Delicious & Nutrient Food



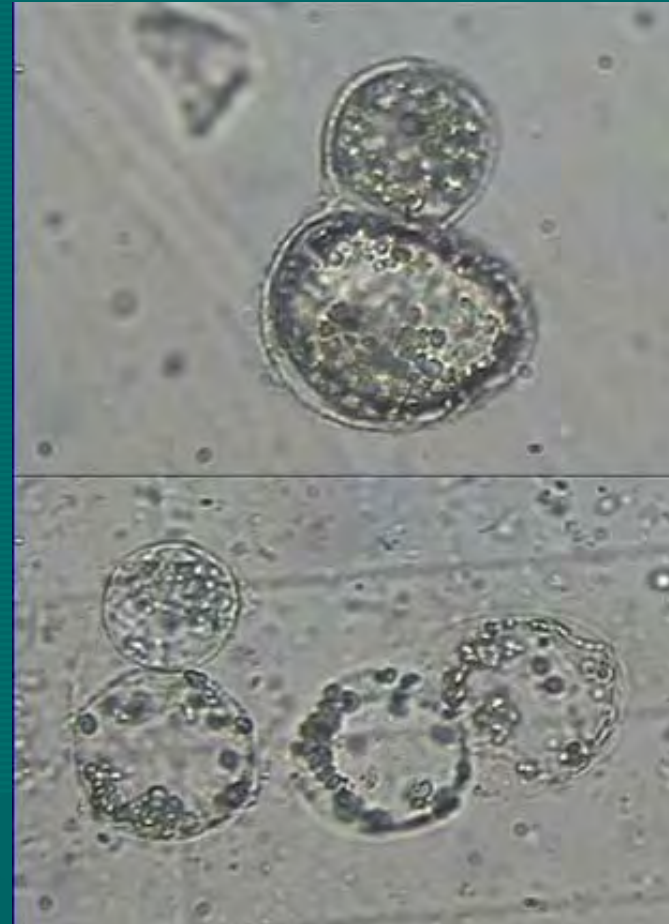
# Germplasm collection and assessment





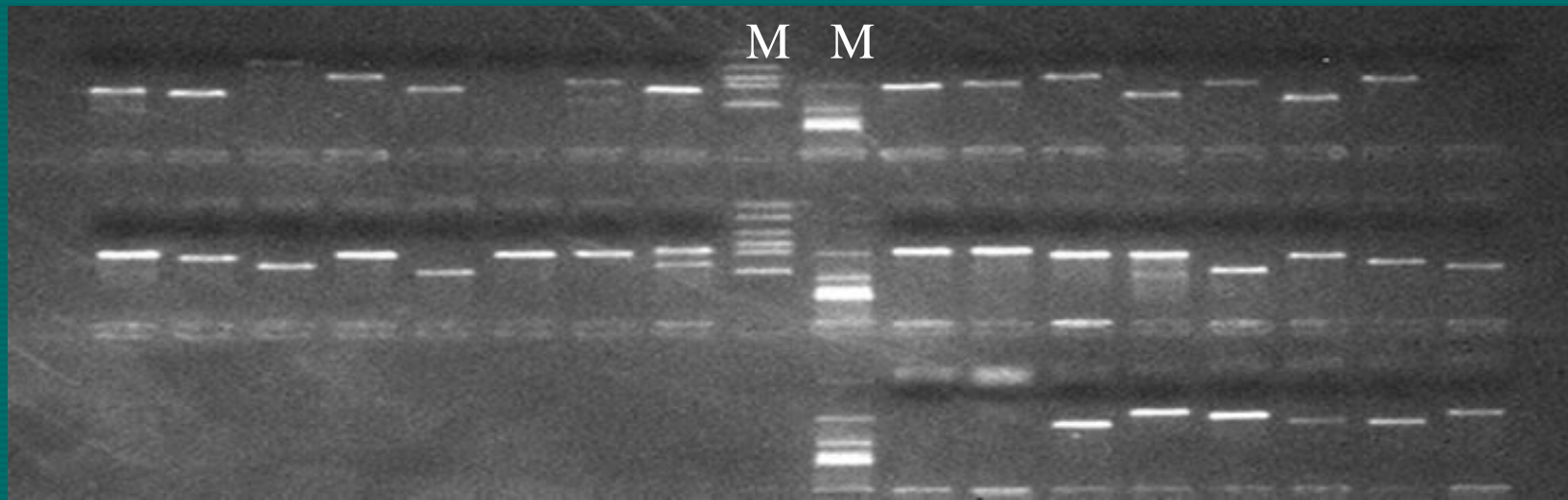
# Ginkgo tissue culture

# Ginkgo protoplast



**Ginkgo protoplast fusion**

# PCR Testing : c-DNA Library of Ginkgo



**Inserted Segments : More than 500 bp**

**Library Size:  $8.12 \times 10^5$  Clones**

**Ginkgo EST: 2000 Clones Sequencing Completed**

# Three sections

- The early cultivars
- The medium cultivars
- The late cultivars

# Six groups

- *Typica* Tsen
- *Huana* Tsen
- *Apiculata* Tsen
- The cuboidal-seed group
- The elipsoidal-seed group
- The ball-seed group

# Some new cultivars from our research team





**The 10<sup>th</sup> Ginkgo Research Congress in China, 2005**

## **Collaboration with overseas institutions:**

USDA, University of Maine, USA

KTH, Royal Institute of Technology, Sweden,  
German, Korea, Japan, etc.

## **In the areas of:**

- Trial production plantings
- Genetic improvement
- Processing of leaves
- Development of by-products



**Prof. YQ Wang discussing the suspension culture of ginkgo cells with Prof. Torkel, KTH in Stockholm, Sweden**

# Resources

- **For ginkgo patents, please refer to:**  
[http://www.ginkgo.net.cn/  
gingko/zhuanli/journal01.html](http://www.ginkgo.net.cn/gingko/zhuanli/journal01.html)
- **For ginkgo other literature, please refer to:**  
[http://www.ginkgo.net.cn/  
gingko/wenxian/journal01.htm](http://www.ginkgo.net.cn/gingko/wenxian/journal01.htm)

# Conclusion

- Native to China, introduced to > 50 countries
- a promising multi-purpose crop
- Nutrient food:
  - good effect in diet therapy
  - cardiovascular diseases
- Great medicinal plant:
  - the ginkgolides, flavon, and biflavon,
  - which treat tracheitis,
  - heart disease, & cerebral hemorrhage

# Conclusion (cont'd)

- Valued timber
- Charming landscape plant
- Sustainable development
- Genetic improvement
- Further collaboration
- Better germplasm, higher yield,  
better qualities

**Thank you!**

