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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

AD HOC CROP SUBGROUP ON MOLECULAR TECHNIQUES FOR ROSE

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ADDENDUM TO DOCUMENT BMT-TWO/ROSE/2/2

APPLICATION OF BIOMOLECULAR TECHNIQUES IN TREE VARIETY IDENTIFICATION IN CHINA

Document prepared by an expert from China

This document is an addendum to document BMT-TWO/Rose/2/2 "Application of Biomolecular Techniques in Tree Variety Identification in China" and contains a copy of the presentation made by Mr. Zheng Yongqi, China.

Application of BMT in identifying tree varieties in China

Contents

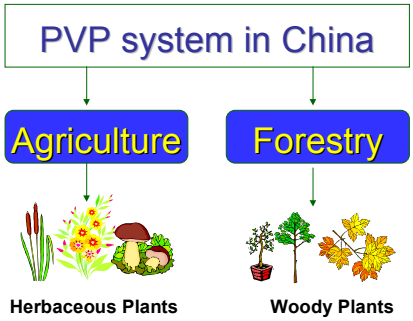
- Introduction to PVP system in forestry
- A brief review of BMT practices in China
- Examples of studies in identification of tree varieties using BMT--
- BMT application for PVP
- Discussions

PVP system in China

Important dates:

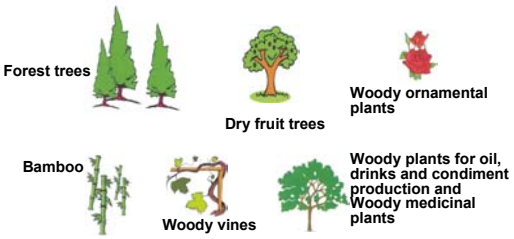
- October 1, 1997: "Regulations of the People's Republic of China on the Protection of New Varieties of Plants "was taken into effect;
- April 23, 1999: China acceded to UPOV;
- August 10, 1999: The "Rules for Implementation of the Regulations of the People's Republic of China On the Protection of New Varieties of Plants (Forest Part)" was promulgated.

PVP system in China



PVP system in China

Scope of PVP in Forestry



Review of BMT practices

1970-1980: Isozyme markers

1990-: DNA markers

- **RFLP, RAPD, AFLP**
- **SSR, ISSR**

Review of BMT practices

- Application of BMT markers
  - Genetic diversity
    - Ginkgo, Abies, Populus, Pinus
  - Classification
    - Cupresus, Magnolia, Paulownia, Ilex, Bauhinia
  - Identification
    - Populus, Ziziphus, Salix, rosa …
    - Species, Clones, Cultivars, varieties

Review of BMT practices

Markers for variety identification

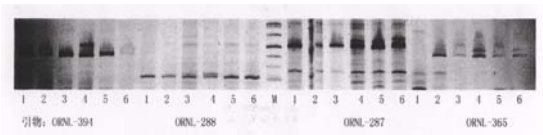
- Isozyme markers
  - Poplar clones
- RAPD
  - Chestnut varieties, rubber tree varieties
- SSR
  - Apple, Poplar,
- ISSR
  - Apricot, Ginkgo, Mulberry

Species	Markers	Purpose
Populus nigra, *P. deltoids* and *Populus* x *euramericana*	isozyme	clone identification
Populus L.	isozyme	clone identification
Ziziphus jujuba Mill.	isozyme	variety identification
Chimonanthus praecox (L.) Link	isozyme	variety identification
Ammopiptanthus nanus and *A. mongolicus*	isozyme	variety identification
Populus tomantosa	isozyme	clone identification
Salix psammiphila	isozyme	clone identification
Toona sinensis	isozyme	variety identification
Actinidi	isozyme	variety identification
Hibiscus	isozyme	variety identification
Punica granatum	isozyme	variety identification
Ginkgo biloba	isozyme	variety identification
Castanea mollissima Bl.	RAPD	variety identification
Rosa hybrida L.	RAPD	variety identification
Rosa rugosa, *Rosa chinensis*	RAPD	variety identification
Hevea brassiliensis	RAPD	variety identification
Populus L.	SSR	variety identification
Juglans regia L.	SSR	variety identification
Camelia sinensis	SSR	variety identification
Michelia tsoi	ISSR	cultivar identification
Osmanthus fragrans	ISSR	cultivar identification
Ginkgo biloba	ISSR	variety identification
Morus alba L.	ISSR	variety identification
Paeonia lactiflora Pall	ISSR	variety identification

Example

Denomination	Place of breeding	Applicant	Description of controversy
'Biyu' Poplar	Inner Mongolia	A	Applicant B complains that the 2 varieties Poplar 'Biyu' and 'Biyun' applied for variety rights by applicant A are the same as B's varieties.
'Biyun' Poplar			
'Tianyan 98' Poplar	Xinjiang	B	
'Tianyan 99' Poplar			
'Tianyan 2000' Poplar			

Example



1: Biyun, 2: Biyu; 3: Tianyan 2000; 4: Tianyan 99; 5: Tianyan 98; 6: Tianyan; M: Standard marker

4 markers fully distinguish all the 6 varieties

Application for PVP

BMT used for two purposes currently:

- **For varieties that are controversial in distinctiveness, BMT was employed to find information as a supplementary evidence to distinctiveness;**
- **For lawsuit cases that courts consider necessary, BMT was used to provide evidences for the courts to make judgments.**
- **A national regulation took into effect since Feb 1, 2007 to use BMT evidence for judgement.**

Discussion

Potential of BMT in trees

- Most varieties are vegetatively propagated;
- Long life span—difficulty for DUS test of morphological traits;
- Varieties often identical in morphological traits, but different in composition of compounds of extracts
- Transgenic poplar trees
- More efficient than field tests

Future efforts

- **Selection of molecular methods**
- **Selection of molecular markers**
- **Standardization of laboratory protocols**
- **Interpretation of results**
- **Formulation of national BMT working group**
- **More studies in BMT application in DUS testing and profiling system**

Thank You!