



INTERNATIONAL SYMPOSIUM
ON
OIL PALM GENETIC RESOURCES & UTILIZATION

8 - 10 June 2000

KL Hilton,
Kuala Lumpur, Malaysia

SOUVENIR PROGRAMME
&
ABSTRACTS

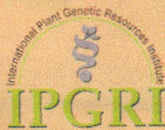
Organised by:



Malaysian Palm Oil Board
Ministry of Primary Industries, Malaysia

in collaboration with:

International Plant Genetic Resources Institute
International Society for Oil Palm Breeders
Bureau for the Development Research on Tropical Perennial Oil Crops



CPRA-6193-1



Souvenir programme and ...
2000
PC-FOL6032

FOL
6032

THE GENETIC DIVERSITY OF THE AMERICAN OIL PALM, *ELAEIS OLEIFERA*
(KUNTH), CORTÉS REVEALED BY NUCLEAR RFLP MARKERS

Barcelos E.¹, P. Amblard², J. Berthaud³ and M. Seguin²

ABSTRACT

The Restriction Fragment Length Polymorphism (RFLP) technique was used to assess the genetic diversity, its organization and the genetic relationships among 36 American oil palm [*Elaeis oleifera* (Kunth), Cortés] populations from Brazil, Peru, French Guyana, Surinam, north of Colombia and Central America, covering a large part of the natural distribution of the species. Polymorphism in 241 accessions was revealed with 37 nuclear cDNA probes and submitted to Factorial Analysis of Correspondences (FAC), cluster analysis and population genetics analysis (F-statistics). The genetic diversity of *E.oleifera* is strongly structured by geographical origin, with 4 groups clearly distinguished: Brazil, Surinam/French Guyana, north of Colombia/Central America and Peru. Within the Amazon basin, there is a moderate structure that corresponds to the major tributaries of the Amazon river. From the 37 polymorphic RFLP probe/enzyme combinations used, 19 probes (51%) presented simple restriction profiles, with 1 or 2 bands per plant, suggesting a single locus with different alleles, allowing allelic co-dominant coding for them. This led to the identification of 59 alleles for all 19 loci. Three rare alleles, with frequencies lower than 5%, were present in the Brazilian populations, while no other allele was found to be rare or very frequent (>95%) in the whole species, nor in any of the sub-geographic groups. Very low levels of polymorphism and heterozygosity were observed in the non-Brazilian groups: Surinam/French Guyana, north of Colombia/Central America and Peru, with some of these being even monomorphic and completely homozygous for the studied RFLP locus. A high genetic diversity was detected in *E. oleifera* by RFLP nuclear analysis, with a mean of 3.1 alleles in the 19 loci and H Nei = 0.404. These values are higher than the genetic diversity estimated for African *E.guineensis* by using the same probes over 51 accessions covering a broad area of the distribution of this species, and is higher also than in other perennial species studied elsewhere.

Keywords: RFLP, genetic diversity, population genetics, tropical perennial species, *Elaeis oleifera*.

¹ Embrapa – CP 319, CEP 69.011.970 – Manaus/AM. Brazil. Barcelos@cpa.embrapa.br

² CIRAD – CP. BP 3053. – Montpellier CEDEX 134032, France. amblard@cirad.fr / seguin@cirad.fr

³ IRD/ORSTOM – CP. BP 5045. – Montpellier CEDEX 1 34032. France. berthaud@orstom.fr