

GENOME ANALYSIS LABORATORY FOR OIL PALM (GALOP)

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The Genome Analysis Laboratory for Oil Palm (GALOP) is a service and core facility which supports the research activities of MPOB's Advanced Biotechnology and Breeding Centre (ABBC). GALOP also extends DNA testing services to the oil palm industry for applications in tissue culture and breeding. Services currently being offered by GALOP include:

- i. DNA fingerprinting;
- ii. DNA banking; and
- iii. Chromosome painting.

DNA FINGERPRINTING

DNA testing based on the restriction fragment length polymorphism (RFLP) technique was innovated for applications in oil palm breeding and tissue culture. The technique makes use of exclusive DNA probes developed at MPOB for verification of the legitimacy of seed-derived plants from controlled crosses in oil palm breeding. In its application to tissue culture, the technique is useful for:

- clonal identification (*Figure 1*);
- monitoring line uniformity (*Figure 2*);
- detecting culture mix-up (*Figure 3*); and
- confirmation of ramet identity for recloning.

DNA BANKING

The DNA Bank for Oil Palm (DNAbop), a repository for oil palm DNA (*Figure 4*), tissues and cultures, is equipped with ultra-low temperature facilities for the long-term storage of biological materials. The stored materials can be utilized as research resources or for reference in future. Used in combination with DNA fingerprinting, the banking of DNA and/or tissues from ortet plants will enable verification of clonal identity of ramets, even when the ortet palm is no longer available.

CHROMOSOME PAINTING

This technique is useful in interspecific breeding programmes for distinguishing between parental genomes

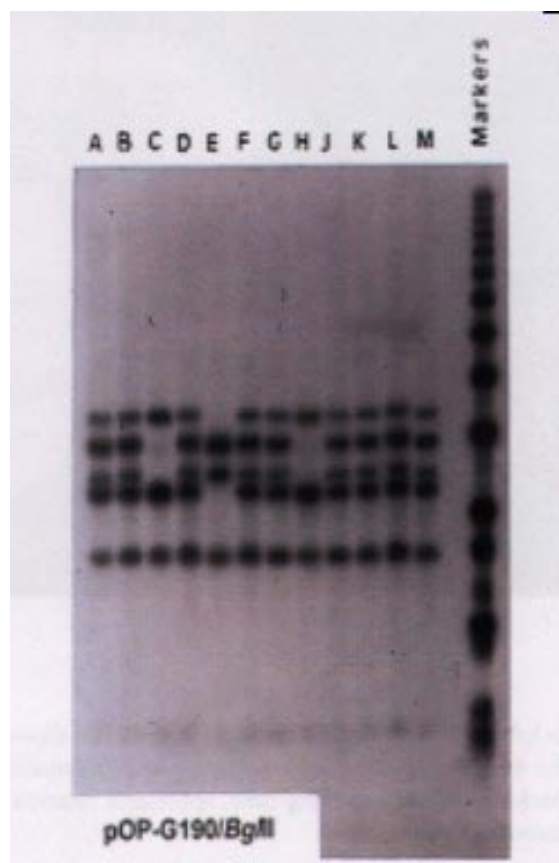


Figure 1. Identification of tissue culture ortets.

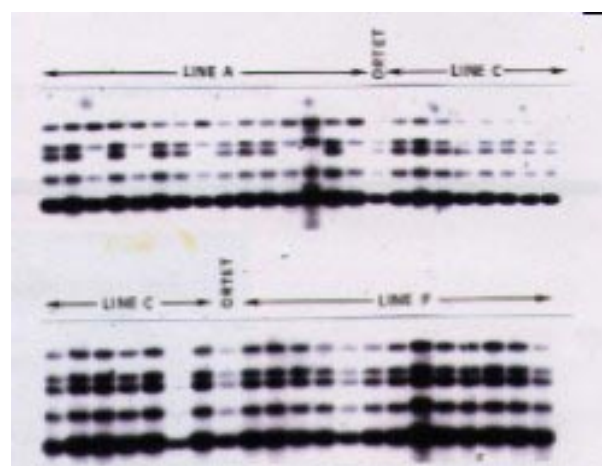


Figure 2. Monitoring uniformity of tissue culture lines.



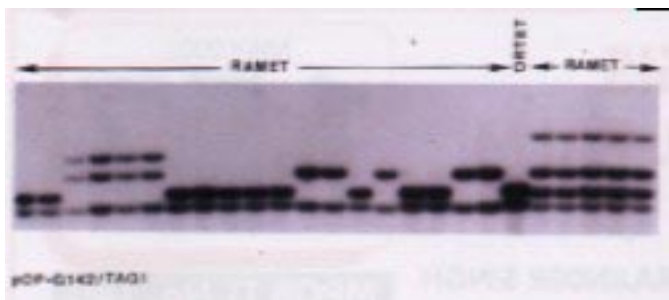


Figure 3. Detecting culture mix-up.



Figure 4. Oil palm DNA.

in hybrids (Figure 5) and backcrosses (Figure 6). This allows for the selection of palms for planting and subsequent backcrossing, thus saving time, space and financial resources.

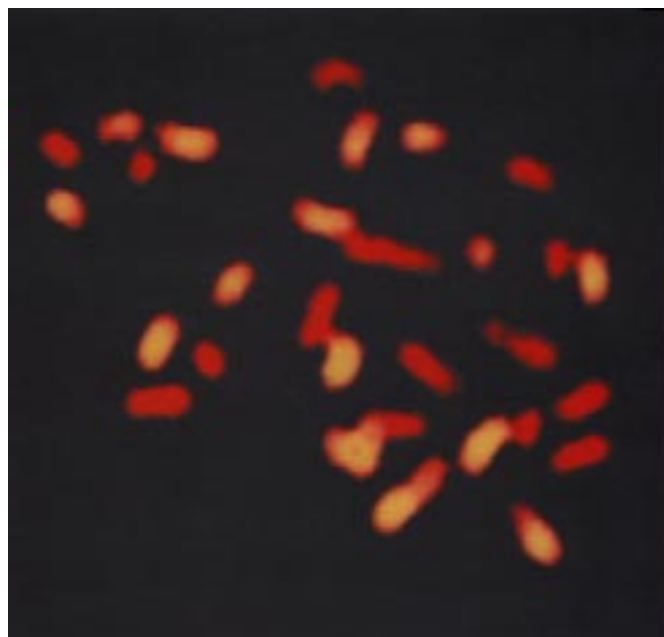


Figure 5. Chromosom painting on *Elaeis oleifera* X *E. guineensis* hybrids showing 16 *E. oleifera* (yellow) and 16 *E. guineensis* (red) chromosomes.

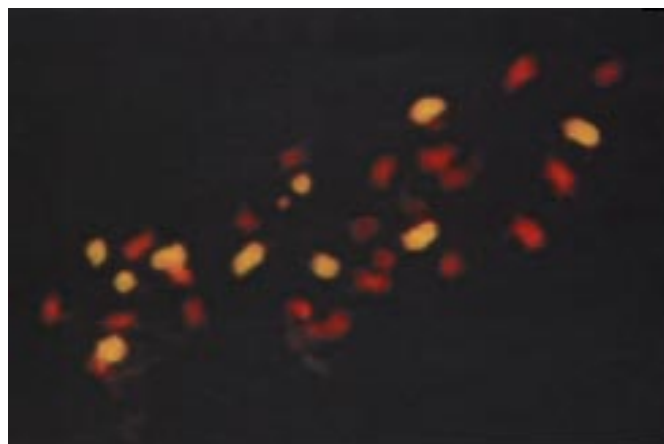


Figure 6. Chromosome painting on backcross individuals showing 10 *E. oleifera* (yellow) and 22 *E. guineensis* (red) chromosomes.

GALOP - Enhancing the quality of oil palm planting materials

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