

SHORT COMMUNICATION

OIL PALM (*Elaeis guineensis*, Jacq.) ISOCITRATE DEHYDROGENASE*5: A RARE ISOZYME VARIANT FOUND IN A POPULATION LOCATED IN BAHIA STATE, BRAZIL

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ABSTRACT

Studies on the polymorphism of Oil Palm pollen Isocitrate dehydrogenase - IDH from palms originating from African populations, revealed the existence of four alleles in one locus. In this work, a new allele, named *IDH*⁵ was detected after starch gel electrophoresis of pollen extracts from open-pollinated bunches from 90 palms of 31 progenies sampled from four localities of the southern coast of Bahia state, Brazil.

INTRODUCTION

The Oil Palm was introduced from Africa into Brazil, mainly by African slaves during the colonial period.

Studies on seven Oil Palm African provenances named Ivory Coast, Benin, Nigeria, Cameroon, Angola and Zaire, showed the presence of four alleles of

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Isocitrate dehydrogenase (IDH; EC 1.1.1.42), according to studies performed by Ghesquiére (1985). These are: *IDH*1*, found in very small frequencies ($f < 0.1$), *IDH*2*, only found in Nigeria ($f = 0.147$); *IDH*3* and *IDH*4*, widespread in all countries investigated.

Since 1981, the Empresa Brasileira de Pesquisa Agropecuária - EMBRAPA has coordinated prospection, collection and preservation of Oil Palm genetic resources from sub-spontaneous populations in the south coast of Bahia state, Brazil. Quantitative and qualitative analyses are being made of this material at the Urubu River Oil Palm Research Station (EERU) of the Centro de Pesquisa Agropecuária da Amazônia - CCAA/EMBRAPA.

This communication is part of a work that aims to study the genetic variability of sub-spontaneous populations of Brazil at the isozyme level.

MATERIAL AND METHODS

The experimental material was pollen (dried, sieved and vacuum stored) from 90 palms of 31 progenies descending from open-pollinated bunches sampled at four localities (Valença, Taperoá, Nazaré e Camamú). All progenies were planted in 1983 in trial BAG 01 at the EERU/CPAA-EMBRAPA experimental station, located near the city of Manaus, Amazonas state, Brazil.

Isozyme extraction, starch gel electrophoresis and visualization were performed according to methodologies described by Ghesquiére (1983). Allele nomenclature was identical to that proposed by Ghesquiére (1985).

RESULTS AND DISCUSSION

Analysis of the results (Table I) showed the existence of a fifth allele, named *IDH*5*, detected in sample A315704, heterozygote *IDH*3/IDH*5*. Palm A315704 is a plant descending from a bunch collected at São Felipe, near the village of Nazaré. Figure 1 represents all phenotypes so far detected in Bahia material at the oil palm pollen IDH locus. *IDH*2* was never detected in samples derived from that region.

Preliminary analysis of this material showed a very heterogeneous genetic composition, probably including materials from various african provenances.

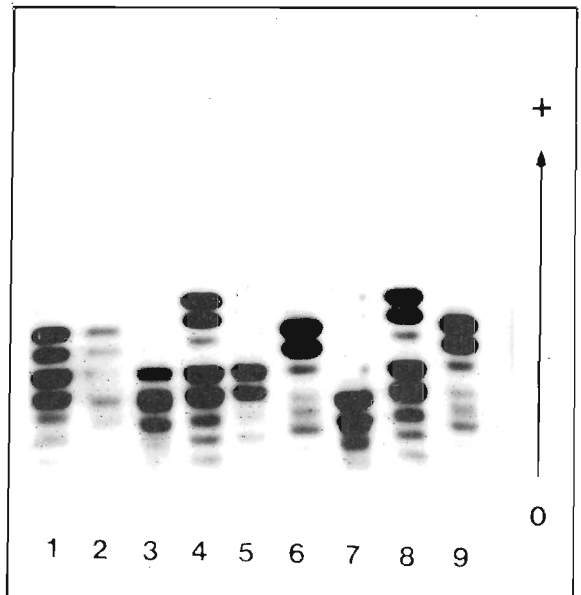
Further analyses of more representative samples from african populations will determine if *IDH*5* is a new mutation or one also present in Africa but not detected so far.

Table I - Frequencies (f), counting (n) and number of genotypes and alleles of the Oil Palm pollen IDH locus after analysis of material derived from 90 palms of 31 progenies descending from bunches sampled from the south coast of Bahia state, Brazil.

Genotypes	n	f
1-1	8	0.09
1-3	12	0.13
1-4	15	0.17
3-3	11	0.12
3-4	18	0.20
3-5	1	0.01
4-4	15	0.28
Total	90	1.00

Alleles	n	f
1	43	0.24
3	53	0.29
4	83	0.46
5	01	0.01
Total	180	1.00

Figure 1 - Phenotypes of Isocitrate dehydrogenase variants present in Oil Palm pollen extracts after starch gel electrophoresis. IDH genotype and palm identification (in parentheses). Lane 1. *IDH*3/IDH*4* (A315103); 2. *IDH*1/IDH*4* (A314505); 3. *IDH*1/IDH*3* (A315109); 4 and 8. *IDH*3/IDH*5* (A315704); 5. *IDH*3/IDH*3* (A314810); 6 and 9. *IDH*4/IDH*4* (A314508); 7. *IDH*1/IDH*1* (A314913).



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RESUMO

Estudos anteriores identificaram 4 alelos de Isocitrato desidrogenase - IDH em seis origens africanas de dendezeiro. Neste trabalho foram analisadas 90 palmeiras de 31 progênes de polinização aberta oriundas de matrizes amostradas em 4 localidades na região de maior ocorrência de dendezeiros subespontâneos do litoral sul do estado da Bahia - Brasil. Eletroforese em gel de amido de extratos de pólen mostrou a existência de um novo alelo, *IDHh*5*, além de 3 outros anteriormente descritos. *IDH*2* não foi detectado nas amostras analisadas.

REFERENCES

- Ghesquiére, M. (1983). Contribution a l'étude de la variabilité genétique du palmier a huile (*Elaeis guineensis*, Jacq.): Le polymorphisme enzymatique. Doctoral Thesis, Université de Paris Sud. Centre D'Orsay, Paris.
- Ghesquiére, M. (1984). Polymorphisme enzymatique chez le palmier à huile (*Elaeis guineensis*, Jacq.). I. Contrôle génétique de neuf systèmes enzymatiques. *Oleagineux* 39: 561-574.
- Ghesquiére, M. (1985). Polymorphisme enzymatique chez le palmier à huile (*Elaeis guineensis*, Jacq.). II. Variabilité et structure génétique de sept origines de palmier. *Oleagineux* 40: 529-540.

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