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Genetic Variation for Plant Breeding

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Oliv-Track - A European project for olive oil traceability

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Abstract

Olive oil is economically very important for Mediterranean countries and its use is considered positively for human consumption and health diet. Therefore, safety issues related with purity (non adulterated oils), quality and traceability of this product are of most relevance. Traceability is particularly important in the case of monovarietal and DOP olive oils. A molecular approach is foreseen in order to correlate DNA extracted from olive oils with DNA molecular markers of the cultivars from which the oil was produced.

Oliv-Track is a European project that involves 14 partners from 6 countries. The coordinator is Nelson Marmiroli from Parma University, Italy. In order to achieve the general goals, the 11 working groups will concentrate their objectives on: feasibility study and genomics of olive oil; molecular markers for olive cultivars; genomic and metabolic profiling; development of a technological platform; forensic analysis of olive oils; and dissemination and exploitation of the results. Access by internet to an integrated information on European cultivars, their characterisation, agronomic performance, regional distribution, oil composition, etc. is also available for general and specialised public.

The Centre of Genetics and Biotechnology of the University of Trás-os-Montes and Alto Douro (CGB-UTAD) is one of the two Portuguese groups involved in OLIV-TRACK, and it is responsible for cultivar database and collaborates in the development of DNA markers. Data obtained by one of the Portuguese teams (CGB-UTAD) are presented in 'Variability analysis between different Portuguese *Olea europaea* L. cultivars by RAPD and ISSR'.

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Variability analysis between different Portuguese olive (*Olea europaea* L.) cultivars by RAPD and ISSR

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Abstract

Olea europaea L. was among the first fruit trees domesticated in the Near East. Cultivars of this area and the Mediterranean hold a great range of genetic variation as shown by DNA markers like random amplified polymorphic DNA (RAPD), amplified fragment length polymorphism (AFLP), and microsatellites (SSR). In Portugal olive represents 10 % of the agricultural production with a high economical impact. Genetic variability was studied in eleven Portuguese cultivars of *O. europaea* using RAPD and intermicrosatellites (ISSR). DNA amplification fragments were separated by agarose gel electrophoresis. A set of primers was defined, 20 from 104 primers tested in RAPD and 17 from 48 primers tested in ISSR, based on their ability to describe the genetic relationships between cultivars. The data analysis was based on the genetic similarity (SM, UPGMA) using NTSYS-PC software. Comparison between the two different markers and their ability to discriminate the olive cultivars will be discussed. Our data seems to point out that RAPDs showed a higher genetic distance between olive tree cultivars than ISSRs. Also, Portuguese olive cultivar clusters obtained with each molecular marker (RAPD and ISSR) analysis and with both of them, are discussed in comparison with cultivars from different Mediterranean countries.

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