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Descrizione fisica	1 online resource (xx, 314 pages) : illustrations (some color)
Classificazione	SCI011000TEC003000
Disciplina	571.92
Soggetti	Plant diseases Plant genetics Agriculture Botany Plant Pathology Plant Genetics Plant Science
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction coffee breeding and challenges -- Choice of materials for mutation induction in arabica coffee -- Improved in-vitro establishment and germination of Coffea arabica seed -- Induced mutagenesis in coffee (Coffea arabica L.) using chemical agents -- Mutation induction using gamma irradiation and high frequency embryogenic callus from coffee (Coffea arabica) -- Chemical mutagenesis of Coffea arabica mature seed using EMS -- Physical mutagenesis of coffee seeds -- In-vitro regeneration of Coffea arabica var. Venecia through somatic embryogenesis -- Protocol on mutation induction in Coffea arabica using in vivo grafting and cuttings -- Protocol on mutation induction in coffee using in vitro tissue cultures -- Screening for resistance to coffee leaf rust -- Protocol to send samples of coffee leaf rust to CIFC -- Coffee leaf rust (Hemileia vastatrix) inoculation and evaluation under laboratory conditions -- Development of a PCR-Based Molecular Detection -- Technique for the

## Early Diagnosis of Coffee Leaf -- Rust Caused by *Hemileia vastatrix* -- Protocols for chromosome preparations: molecular cytogenetics and studying genome organization in coffee. .

### Sommario/riassunto

This open-access book presents essential concepts and new, illustrated methods for mutation-assisted breeding of *Coffea arabica* L. (Arabica), one of the world's most important cash crops and beverages. Arabica coffee accounts for about 60% of the world's coffee production. Coffee leaf rust (CLR), caused by the fungus *Hemileia vastatrix* is the major disease affecting Arabica coffee resulting in losses of over \$1 billion annually. The geographical distribution of CLR is expanding due to climate change. Moreover, the genetic improvement of Arabica coffee is constrained due to its very narrow genetic base. This protocol book covers practical methods to enhance genetic diversity in Arabica coffee through induced mutagenesis and for screening for resistance to CLR. Current breeding approaches, challenges, and opportunities for Arabica coffee improvement are briefly reviewed and a survey of common coffee diseases with emphasis on CLR is presented. Based on latest advances in science and technology, this book includes novel methods for single-cell mutagenesis using in vitro cell and tissue culture techniques and for genome-wide screening of induced mutations using genomics tools. Each protocol chapter provides step-by-step illustrated methods supported by example results. Given the impact of recent CLR epidemics on Arabica coffee production in Latin America, the book is intended to serve as a timely reference and guide for students and researchers in the agricultural sciences, plant pathologists and breeders, as well as growers and end-users interested in producing novel coffee genotypes for genetic studies, breeding, and commercial applications. .