

Characterisation and Genetic Mapping of a Gene Conferring Resistance to Coffee Berry Disease (*Colletotrichum kahawae*) in Arabica Coffee (*Coffea arabica* L.)

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SUMMARY

Coffee Berry Disease (CBD) which is an anthracnose of coffee berries caused by *Colletotrichum kahawae* Waller and Bridge, is a major problem in Arabica coffee (*Coffea arabica* L.) producing countries in Africa. Breeding for resistance to this disease has thus been a major priority to these countries. One of the sources of resistance to this disease is genomic material of *Coffea canephora* Pierre introgressed into *C. arabica* genome. This introgression occurred via a natural cross between *C. arabica* and *C. canephora*, referred to as Hibrido de Timor (or Timor hybrid). In order to decipher the genetic base of the resistance gene, an F2 mapping population of a cross between Catimor as the donor and SL28 as the susceptible parent was established. Catimor is a *C. arabica* cultivar derived from Hibrido de Timor by crossing to Caturra, while SL28 is a susceptible commercial variety in Kenya. The population was screened for resistance to the disease by a two-step strategy which facilitated both verification of segregation and availability of counter-checking plant materials during the study. The first screening step was carried out 6 weeks after germination on half of the population by hypocotyls inoculation method. The second screening for CBD reaction was done after 1 year by young seedlings inoculation method on the other half of the population (Group 2) and resistant plants obtained during the hypocotyls inoculation step (Group 1). Microsatellite and Amplified Fragment Length polymorphism (AFLP) markers were used to analyse up to 95 segregating plants screened only by the shoot tips method, and 27 plants screened by both methods and identified as resistant. The use of the two screening methods helped to counter the disadvantages of each while providing a comparative verification system involving the two phenotypic classification and molecular markers. The results obtained by the molecular markers enabled the identification and mapping of a simply inherited major resistance gene, designated *Ck-1*, which is likely to be the one reported by van der Vossen and Walyaro (1980). The gene was located onto a mapped *C. canephora* chromosomal fragment introgressed into *C. arabica* genome. The significance of the results and further research needs in this line are discussed.