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The Catechin Content and its Genetic Dissection in Tea Plants

Tea catechins have various activities that greatly benefit human health, for example, antioxidative, antihypertensive and anticarcinogenic activities. Catechins and their oxidation products are one of the major secondary metabolites accumulated in tea plants which are major contributors to tea quality attributes. Catechins composition and content determine the processing suitability of tea cultivars. Understanding of the genetic basis of catechin traits is important for tea breeding programs.

In this study, natural variations of catechin content were detected among a set of representative Chinese core collection tea germplasms including wild related species, landraces, improved cultivars and genetic materials, etc. Two of them with different catechin contents, morphological characteristics and other important agronomical traits were selected to produce a controlled F1 segregation population. A high density SSR/SNP genetic linkage map was constructed for QTLs analysis. Two major and stable QTLs associated with catechin content was identified using the linkage mapping.Flavonoid-3',5'-hydroxylase (F3'5'H), chalcone syntheses(CHS) were subsequently found to be the functional genes using BSR-Seq and association analysis. Meanwhile, ten functional SNP loci were validated in F3'5'H and CHS, respectively. Two functional markers were successfully developed for further marker-assisted selection and molecular breeding of catechin content in tea plants.

Biography:

Liang Chen completed his PhD on Tea Science from Zhejiang University, China and postdoctoral studies from Cornell University, USA. He also visited Japan, Italy and The Netherlands as senior visiting professor. Now, he is the professor on tea genetic resources, genetics, breeding and genomics in the Tea Research Institute, Chinese Academy of Agricultural Sciences (TRICAAS). He is the leading expert of Tea Germplasm Group of the CAAS through the Agricultural Science and Technology Innovation Program. He has been appointed twice as Honorary Scientist of the RDA of the Republic of Korea. He has published more than 50 papers in reputed international journals and has been serving as several editorial board members of reputed committees.