

Genetic control of agronomically important traits of pepper fruits analyzed by Hayman's partial diallel cross scheme

A.R. Schuelter¹, G.M. Pereira², A.T. Amaral Júnior³, V.W.D. Casali⁴,
C.A. Scapim⁵, W.S. Barros⁶ and F.L. Finger⁴

¹Laboratório de Biotecnologia, Universidade Paranaense, Toledo, PR, Brasil

²Instituto de Ciências Exatas e Tecnologia,
Universidade Federal do Amazonas, Itacoatiara, AM, Brasil

³Laboratório de Genética e Melhoramento Vegetal,
Universidade Estadual do Norte Fluminense Darcy Ribeiro,
Campos dos Goytacazes, RJ, Brasil

⁴Departamento de Fitotecnia, Universidade Federal de Viçosa, Viçosa, MG, Brasil

⁵Departamento de Agronomia, Universidade Estadual de Maringá,
Maringá, PR, Brasil

⁶Departamento de Matemática e Estatística,
Universidade Federal de Pelotas, Pelotas, RS, Brasil

Corresponding author: A.R. Schuelter
E-mail: adilson_schuelter@yahoo.com.br

Genet. Mol. Res. 9 (1): 113-127 (2010)

Received September 16, 2009

Accepted October 23, 2009

Published January 19, 2010

ABSTRACT. Pepper species of the genus *Capsicum* have been cultivated over centuries, producing both pungent and sweet fruit; the pungency is caused by alkaloids called capsaicinoids. Among the five cultivated species, *Capsicum chinense* is one of the most popular, being native to the Amazon basin. This species is characterized by a wide variety of fruit sizes, shapes and colors, with different capsaicinoid content. In addition, fruits are rich in vitamins A and C. Despite the importance of this plant as a spice and its medicinal uses, research on its genetic variability and potential for breeding programs is still incipient. We investigated the genetic control of some traits through diallel analysis

with the objective of introgressing these traits into cultivated varieties. For the diallel analysis, the progeny of crosses between peppers with pungent and sweet fruits, together with the parents, were grown in pots under greenhouse conditions. The fruits were harvested and analyzed for the traits total fresh fruit mass, total dry fruit mass, percentage dry matter, total soluble solids, vitamin C content, fruit pungency, and number of seeds per fruit. Genetic variability was detected for all traits. In the diallel analysis, the additive-dominant model was considered to be adequate for total fresh fruit mass, percentage dry matter, total soluble solids, and vitamin C content. Additive genetic effects and dominance were found for all traits; consequently, breeding for improvement of these fruit traits would be viable.

Key words: Partial diallel analysis; Hayman methodology; Inheritance; Gene effect; *Capsicum chinense*