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CULTIVAR RELEASE

MT BB: Tomato cultivar for practical classes of plant genetics and breeding

Fernando Angelo Piotto[1*] and Giancarlo Conde Xavier Oliveira[1]

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Abstract – *MT BB cultivar originated from a backcross program which aimed at adding two recessive mutations that alter leaf architecture (potato leaf – c) and flower color (white flower – wf) to Micro-Tom cultivar, which is a tomato miniature. MT BB was developed for use in practical classes of genetics and breeding in both undergraduate and graduate courses.*

Key words: Solanum lycopersicum*, mutations, teaching.*

INTRODUCTION

Tomato (*Solanum lycopersicum* L.) is one of the most important vegetables in Brazilian and world economy. Besides, this species has been used as a model plant for several studies in physiology, biochemistry, genetics and genomics **(**Stevens and Rick 1986, Emmanuel and Levy 2002). Similarly to the model plant *Arabidopsis thaliana* (L.) Heynh., the miniature tomato cultivar Micro-Tom (MT) (*S. lycopersicum* cv. Micro-Tom) presents reduced height (little more than 15 cm), and can be grown in small pots, plastic cups or seedling bags (Scott and Harbaugh 1989). Its reproductive cycle is short, flowering 30 to 40 days after sowing, and its fruits are harvested between 80 and 90 days after sowing (Meissner et al. 1997). With the objective of using model plants in practical classes of genetics and breeding, MT BB miniature tomato cultivar was developed, derived from MT cultivar, which has mutations for leaf architecture and flower color. Thus, it is possible to obtain progenies from crosses with MT cv., which can be used for studies on gene segregation in F_1, F_2 and backcrossed populations (Piotto and Oliveira 2012).

ORIGIN AND DEVELOPMENT OF MT BB CULTIVAR

'MT BB' originated from a backcrossing program carried out to incorporate *white flower* (*wf*) and *potato leaf* (*c*) recessive mutations from accessions LA 0159 and LA 4348, respectively, in MT cv.. Both accessions were obtained from the *Tomato Genetics Resource Center* (TGRC, Davis, California, EUA).

CHARACTERISTICS OF 'MT BB'

'MT BB' is short (Figure 1A) and has determined growing habit due to the presence of *self-pruning (sp)* recessive mutation in homozygosity, which causes the apical meristem to end in two consecutive inflorescences (Figure 1B), a common character state in tomato cultivars bred for industrial processing (Piotto and Peres 2012). Leaves are of the "potato" type, whose phenotype is conditioned by *potato leaf* (*c*) recessive mutation. Mutated leaf is characterized by the formation of one to three leaflets, having the central leaf a blade much larger than the lateral ones, and by showing fewer indentations on the margins (Figure 1C). Potato leaf mutation has been traditionally used as a marker linked to resistance to a type of geminivirus (*Tomato mottle virus* - *ToMoV*), and arose spontaneously in the USA, although one of its known allelic forms has been isolated from *S. chilense* (Scott 2002). The new cultivar has also whitish flowers which accumulate a lesser quantity of carotenoids in the petals, a character state controlled by the recessive mutation *white flower* (*wf*) (Figure 1D) (Galpaz et al. 2006). The "potato" leaf and whitish flowers of MT BB cv. contrast with the "normal" leaves with five similarly sized leaflets (*CC*, *C* being dominant to *c*) and the yellow flowers (*WfWf*, *Wf* being dominant to *wf*) *white flower* and *potato leaf* mutations are located on chromosomes 3 and

[1] Universidade de São Paulo, Escola Superior de Agricultura "Luiz de Queiroz", Departamento de Genética, C. P. 83, 13.418-900, Piracicaba, SP, Brasil. *E-mail: fpiotto@gmail.com

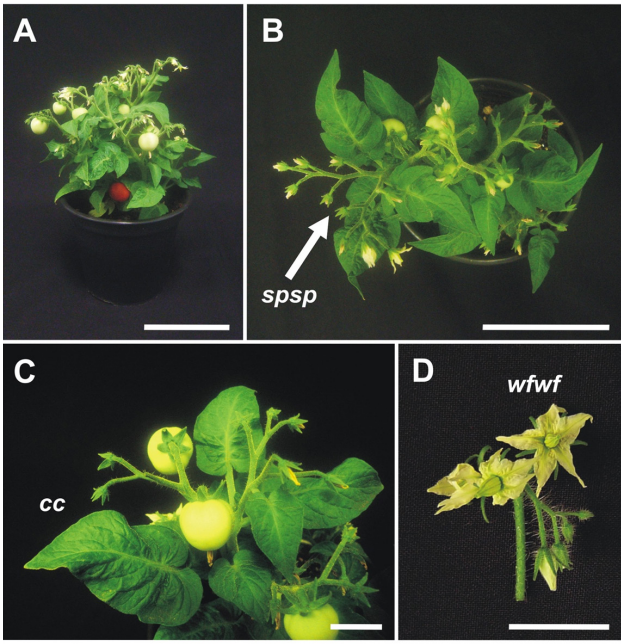

Figure 1. Morphological characteristics of MT BB tomato cultivar. A) reduced height (ca. 15 cm); B) determinate growing habit due to the presence of *self-pruning (sp)* recessive mutation in homozygosity, which causes the apical meristem to end in two consecutive inflorescences; C) potato leaf (*cc*), with formation of one to three leaflets, having the central leaflet a blade much larger than the lateral ones; D) whitish flowers due to the presence of *white flower* (*wf*) mutation, which reduces the accumulation of carotenoids in the petals and anther cone. Bars in Figures 1A and 1B = 10 cm. Bar in Figures 1C and 1D = 2 cm.

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6, respectively (Stevens and Rick 1986). The reproductive biology and the cultivation characteristics of MT BB cv. are practically identical to those described by Meissner et al. (1997) for MT cv.

SEED PRODUCTION

Genetic seeds of MT BB cv. are kept by the Department of Genetics of "Luiz de Queiroz" Agriculture School, University of São Paulo (ESALQ/USP), in Piracicaba, SP, Brazil. Seed samples of MT and MT BB cultivars can be ordered with no cost by email (fpiotto@gmail.com or gcxolive@gmail.com). Instructions about cultivation, maintenance and use in genetics and breeding classes are described in Piotto and Oliveira (2012).

CONCLUDING REMARKS

MT and MT BB cultivars have a great potential as a didactic resource for teaching classic genetic concepts. The small height and short life cycle of these cultivars allow the demonstration of crossings, the synthesis of F_1, F_2 and backcrossed populations. Therefore, progenies of crosses involving MT and MT BB cultivars can be used to illustrate monogenic and digenic segregation, dominance and recessivity, and the concepts of character and character state, among others, and can become a valuable teaching resource in genetics and breeding courses.

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