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# Breakthroughs in the Genetics and Breeding of Capsicum and Eggplant

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## Variation for fruit shape morphology and candidate genes in eggplant materials

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### Abstract

Cultivated eggplant (*Solanum melongena*) presents a wide phenotypic diversity for fruit morphology. New technologies have improved the quantity and quality of data that can be obtained for the morphological characterization of fruit traits. In this respect, the free software Tomato Analyzer allows the accurate and objective measurement of fruit shape and size of eggplant fruits. Tomato Analyzer characterization coupled with molecular characterization of candidate genes for fruit shape can be useful for elucidating the genetic control of fruit shape in eggplant, as well as for marker assisted selection. We crossed two eggplants with different fruit shapes: semi-round (Cristal) and long (Feng Yuang Purple) and obtained the F2 generation. A wide variability in fruit shape, which was characterized with Tomato Analyzer, was observed in the 53 individuals of the F2. These results, together from those of the F2 of another cross between a long and slender eggplant accession (MM1597) and a flat and fasciated accession (A0416) suggest that several genes affecting fruit shape are segregating in these populations. Conversely, a number of key genes have been described as responsible for controlling fruit shape in Solanaceae fruits. Among them, genes *SUN* and *OVATE* control fruit elongation in tomato fruits. In this respect, we are evaluating the allelic diversity of these genes in the Cristal and Feng Yuang Purple parentals. This will help us to develop molecular markers of the different genes and evaluate the potential role of the alleles in the control of fruit shape in eggplant. Also, other progenies developed by INRA which include different fruit shapes will be used for identifying possible allelic diversity of these genes within *S. melongena*. These materials may be useful for the identification of fruit shape QTLs and genes other than *SUN* and *OVATE*. These studies will help us to shed light on the genetics of fruit shape in eggplant as well as to identify the loci involved in creating the large and variably shaped fruit characteristic of the eggplant germplasm.

**Keywords:** *OVATE* gene, *Solanum melongena*, *SUN* gene, Tomato Analyzer.