

**Genetic analysis of tomato (*Solanum lycopersicum* L.) and
tomatillo (*Physalis ixocarpa* Brot.) genotypes based on their
quality traits.**

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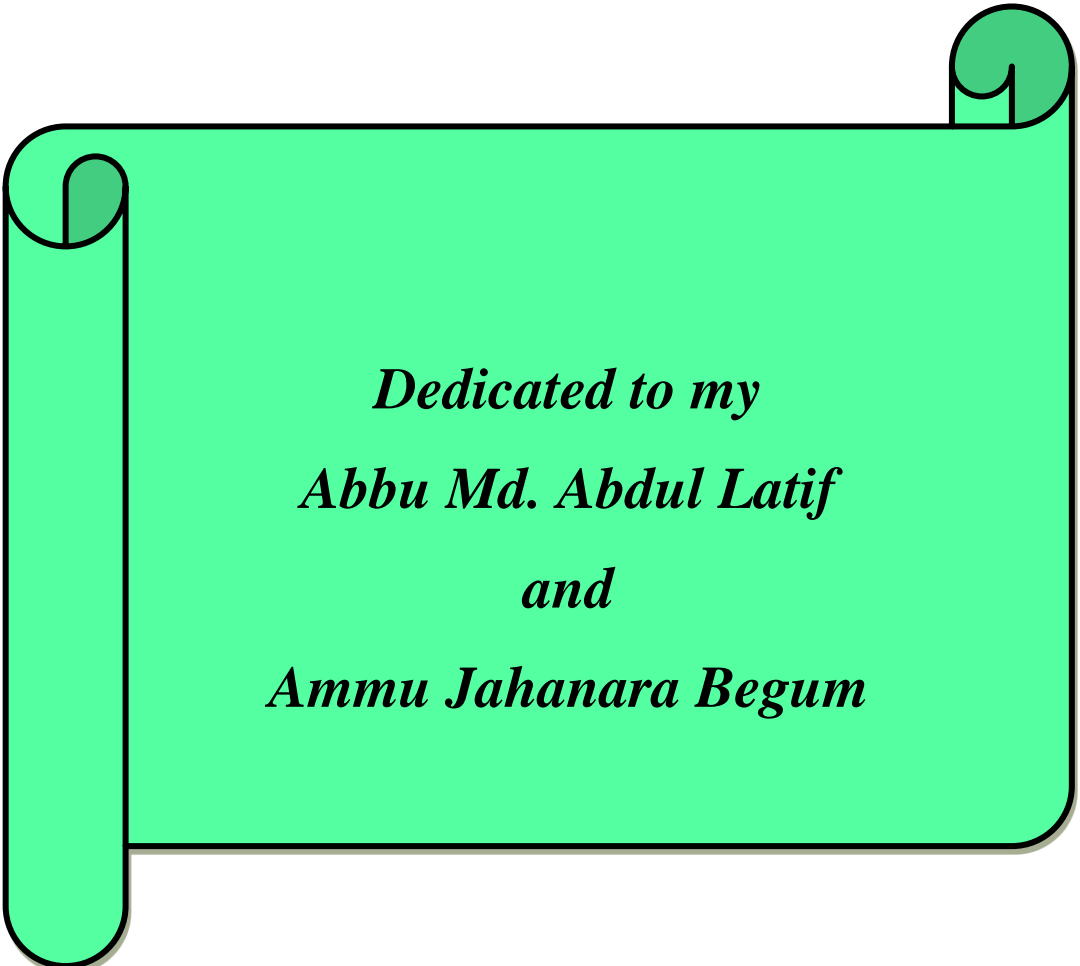
CERTIFICATE

*This is to certify that thesis entitled, "Genetic analysis of tomato (*Solanum lycopersicum* L.) and tomatillo (*Physalis ixocarpa* Brot.) genotypes based on their quality traits." submitted to the faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE IN GENETICS AND PLANT BREEDING**, embodies the result of a piece of bona fide research work carried out by Shamim Reza, Registration No.: 15-06942 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.*

I further certify that such help or source of information, as has been availed of during the course of this investigation has been duly been acknowledged by him.

Dated: June, 2016
Place: Dhaka, Bangladesh

(Prof. Dr. Naheed Zeba)
Supervisor



*Dedicated to my
Abbu Md. Abdul Latif
and
Ammu Jahanara Begum*

Some commonly used abbreviations

Full word	Abbreviations	Full word	Abbreviations
Agricultural	<i>Agril.</i>	Number	No.
Agriculture	<i>Agric.</i>	Negative logarithm of	pH
And others	<i>et al.</i>	hydrogen ion	
Applied	<i>App.</i>	concentration	
Bangladesh	BARI	(-log[H ⁺])	
Agricultural Research		Nutrition	<i>Nutr.</i>
Institute		Perchloric Acid	HClO ₄
Bangladesh Bureau of	BBS	Percentage	%
Statistics		Plant Genetic Resource	PGRC
Biology	<i>Biol.</i>	Centre	
Calcium ion	Ca ²⁺	Review	<i>Rev.</i>
Centimeter	Cm	Physiology	<i>Physiol.</i>
Environment	<i>Environ.</i>	Research and Resource	<i>Res.</i>
Etcetera	etc.	Serial	Sl.
Food and Agricultural	FAO	Science	<i>Sci.</i>
Organization		Soil Resource	SRDI
Gram	G	Development Institute	
Gram per liter	g/L	Technology	<i>Technol.</i>
Horticulture	<i>Hort.</i>	That is	i.e.
International	<i>Intl.</i>	Ton	T
Journal	<i>J.</i>	Videlicet (namely)	viz.
Milligram per liter	mg/L	United States of	U.S.A.
Milligram(s)	Mg	America	
Milliliter	mL	Ultraviolet	UV

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ABSTRACT

An experiment was conducted to observe the performances of four tomatillo and two tomato genotypes under three different replications in same growing season. The factorial experiment included four tomatillo and two tomato genotypes viz. G₁ (SAU tomatillo-1), G₂ (SAU tomatillo-2), G₃ (PI003), G₄ (PI004), G₅ (BD-7306), G₆ (BD-7761) were outlined in Randomized Complete Block Design (RCBD). 20 days aged seedlings were transplanted to main field. The results showed that both the different tomatillos and tomatoes genotypes genotype G₆ had the highest pH (4.90) and the lowest pH was found in the genotype G₂ (3.80). The genotype G₆ had the maximum vitamin C (26.58 mg/100g) whereas the minimum (0.00 mg/100g) was found from G₃. The highest dry matter content was observed by the genotype G₁ (1.20 g) and the lowest dry matter content was found in G₅ (0.30 g). The highest brix % (5.800%) was observed in G₄ whereas the lowest (2.617%) from G₅. The genotype G₅ recorded the highest lycopene content of the fruit (20.61 mg), while the lowest was observed by the genotype G₄ (0.2833 mg) in case of 472 nm. In case of 502 nm the highest lycopene content of fruit was observed in genotype G₁ (26.62 mg) and the lowest was observed in the genotype G₄ (0.07667 mg). The maximum moisture percentage was checked in the genotype G₅ (95.0 %) and the minimum was checked in the genotype G₁ (77.67 %). The conducted study disclosed that high heritability coupled with high expected genetic advance as percent of means were observed in case of p^H (95.05 % and 21.72 % respectively), vitamin C (97.69 % and 273.45 % respectively), dry matter content (87.39 % and 97.26 % respectively), brix (98.33 % and 65.26 % respectively), lycopene at 472 nm (97.88 % and 303.84 %) and lycopene at 502 nm (98.78 % and 251.89 %) respectively indicating good response to selection for these characters. Therefore, based on the quality performance of tomatillo and tomato genotypes, G₁ could be selected for high dry matter content, high lycopene and more brix% in the fruit. But for vitamin C as well as fruit p^H genotypes G₆ could be selected. For bulky, that means with high moisture percentage as well as with high lycopene content, G₅ could be selected.