

ABSTRACT

Safira Rosa Az-zahra. 24020123420008. Growth and Lycopene Content of Tomato Callus Culture (*Solanum lycopersicum* L.) in Media with Different Acidity Levels. Under the guidance of Yulita Nurchayati dan Nintya Setiari.

Tomato plants grow optimally at a pH range of 5.5–7.0. The reduction in available agricultural land necessitates efforts to utilize land with extreme conditions, such as acidic soils. The potential of tomato plants to grow under acidic conditions can be evaluated through callus culture. This study aimed to analyze the growth response and lycopene production of tomato callus and to determine the correlation between growth parameters and lycopene production under acidic culture media. The research was conducted using callus culture supplemented with BAP and 2,4-D, employing tomato cotyledon explants. The experiment was arranged in a Completely Randomized Design (CRD) with a single factor, namely different media pH levels (6, 5, 4, and 3), with three replicates. Treatments were applied by subculturing a portion of the callus from each pH level for seven days. Quantitative parameters included the time of callus initiation, percentage of callus formation, fresh weight, dry weight, and lycopene content, while qualitative parameters included callus color and texture. The data were analyzed using ANOVA followed by Duncan's Multiple Range Test (DMRT) at a 95% confidence level. The results showed that the explants formed callus at 11 days after culture initiation. Media pH treatments increased the fresh weight, dry weight, and lycopene content of tomato callus. The callus exhibited a compact texture with progressively browner coloration as pH decreased. All calli showed a survival rate of 100%. The correlation between decreasing media pH and callus fresh weight was 76.03%, callus dry weight was 74.37%, and lycopene content was 0.48%. In conclusion, tomato callus was able to grow and survive under acidic media conditions and produced lycopene at all pH levels, indicating its potential to be regenerated into tomato plantlets tolerant to acidic stress.

Keywords: *pH, Callus Culture, Tomato, Lycopene*