

Effects of Moisture Stress on Selected Biochemical Parameters and Yield of Three Tomato (*Solanum Lycopersicum* Mill.) Cultivars during the Flowering Stage

M.S.K. Beham¹, S. Mahendran¹ and S. Puvanitha^{2*}

¹Department of Agricultural Biology, Eastern University, Chenkalady, Sri Lanka
²Department of Biosystems Technology, Eastern University, Chenkalady, Sri Lanka

There is a need to utilize water efficiently and effectively because water availability is scarce in the Dry Zone of Sri Lanka. Tomato is grown in the Batticaloa district to a limited extent. The yield is low because growth of tomato is highly affected by moisture and heat stresses especially during the *Yala* season. This experiment was conducted in a farmer's field near to the Eastern University of Sri Lanka at Batticaloa district. Investigations were carried out to determine the effect of moisture stress on selected biochemical parameters of three tomato cultivars *viz.* 'Roma', 'Thilina' and 'KC1' during the flowering stage and to find out the most suitable tomato cultivar which resists to drought without much yield reduction. This experiment was laid out in the Two Factor Factorial Randomized Complete Block Design with six treatments and four replications. Moisture stress was imposed for a period of six days for the treated plants during the flowering stage. The control plants were irrigated daily to the Field Capacity. Free proline and lycopene contents were significantly higher and chlorophyll content was significantly lower in the stressed than that of control treatments. The 'KC1' tomato cultivar showed the highest amount of free proline (0.56 mg cm⁻²) and lycopene (73.6 mg g⁻¹) contents and lowest amount of chlorophyll (0.28 mg g⁻¹) content than Roma (0.54 mg g⁻¹) and Thilina (0.37 mg g⁻¹) cultivars. Moisture stress significantly ($p < 0.05$) reduced the yield of 'KC1', 'Roma' and 'Thilina' tomato cultivars. The highest yield (5252 kg ha⁻¹) was obtained in the 'KC1' with low (14%) yield reduction and the lowest yield (4080 kg ha⁻¹) was found in 'Thilina' with high (31%) yield reduction under moisture stress. From these results it could be stated that 'KC 1' was able to resist drought better than the rest of the tomato cultivars and produced the yield well under this condition. Hence, 'KC1' tomato cultivar could be suggested for tomato growers in the drought prone areas in Batticaloa District.

Keywords: Free praline, Lycopene, Moisture stress, Tomato, Yield