

EFFECT OF EXOGENOUS APPLICATION OF SALICYLIC ACID ON ALLEVIATION OF DROUGHT STRESS OF IMMATURE TEA (*Camellia sinensis*) PLANTS

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Drought can be considered as one of the major limitations to improve tea yield in certain parts of Sri Lanka. In addition to adopting long-term drought mitigation strategies, it is necessary to take timely provisions to reduce short-term drought effects to improve plant vigor. Application of salicylic acid (SA) has resulted in positive impacts in improving the physiological and growth parameters under drought in other crops. Knowledge on plant hormonal regulation on tea is scanty but important especially under climate change. Therefore, potential of minimizing the drought effects on tea *via* exogenous application of SA was studied under a controlled environment (average temperature 28 °C, average relative humidity 50% and photosynthetically active radiation 1,200 $\mu\text{moles m}^{-2} \text{s}^{-1}$) at the Tea Research Institute at Talawakelle, Sri Lanka, using one-year-old tea cultivars, namely, TRI 2025 (drought tolerant) and TRI 2023 (drought susceptible). Plants were exposed to a drying cycle while they were foliar sprayed with SA at various concentrations (0, 50, 100, 150 and 200 mg L^{-1}) along with well-watered and no-spray treatments arranged according to Randomized Complete Block Design (2 blocks, 24 replicate plants per cultivar per treatment). Data were collected at 18 hours and 3, 7, 14 and 21 days after applying the treatments from randomly selected plants. Physiological and biochemical parameters were measured (09:00 - 12:30 h) along with soil moisture content. Moisture stress resulted in declining of all gas exchange parameters, leaf relative water content and accumulated osmolytes (total soluble sugar and proline) in both tea cultivars compared with those under well-watered conditions. Foliar application of 150 and 200 mg L^{-1} SA were the best treatments that reduce drought impacts on the physiological parameters significantly in comparison to the no spray treatment. Considering the environmental impact and cost effectiveness, application of 150 mg L^{-1} SA may be considerably effective in reducing the drought impact on young tea. Further studies are necessary to determine the frequency of application to sustain the plant vigor during drought.

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