



MORPHOLOGICAL AND PHYSIOLOGICAL RESPONSES OF MANGO (*Mangifera indica* L.) TO DROUGHT STRESS AND DROUGHT ALLEVIATION STRATEGIES DURING EARLY SEEDLING STAGE

Rachel C. Sotto^{1*}, Nonnatus S. Bautista¹, Lailani A. Masungsong¹, Franz
Allen C. Estrella², Jose Angel Jude B. Telan², and Alangelico O. San
Pascual^{2,3}

¹Institute of Biological Sciences, College of Arts and Sciences,
University of the Philippines Los Baños, Laguna, Philippines

²Graduate School, University of the Philippines Los Baños, Laguna, Philippines

³Institute of Plant Breeding, College of Agriculture and Food Science,
University of the Philippines Los Baños, Laguna, Philippines

*Corresponding author: rcsotto@up.edu.ph

ABSTRACT – The effects of drought stress and selected drought alleviation strategies on the morphological and physiological responses were investigated on seedlings of mango (*Mangifera indica* L.) cv. ‘Manila Super Mango.’ Two weeks before drought stress imposition, the seedlings were treated with 40 mM acetic acid, 1 mM hydrogen peroxide, 2 ppm potassium silicate, and 0.5 mM salicylic acid. Drought stress was imposed by withholding water for 15 days. Morphological and physiological responses measured before and after drought imposition were plant height, stem diameter, number of leaves, stomatal aperture length, width and area, stomatal density, relative water content, and chlorophyll a content. Drought arrested the growth of stem diameter and induced leaf abscission. Stomatal density increased but with a concomitant decrease in stomatal aperture length, width, and area. Relative water content decreased while chlorophyll a content increased. As for the effect of drought alleviation treatments, comparable responses were observed for the plant growth parameters, stomatal responses, and chlorophyll a content. However, for relative water content, seedlings treated with 40 mM acetic acid and 2 ppm potassium silicate exhibited significantly higher relative water content than the other treatments. Furthermore, it was observed that mango seedlings can tolerate 15 days of drought. It is recommended that additional drought-alleviating measures be tested and that a more prolonged drought period be imposed to observe the stress-alleviating effects of the different treatments.

Keywords: drought alleviation, drought stress, mango, morphological responses, physiological responses, seedling stage



JOURNAL OF NATURE STUDIES
(formerly Nature's Bulletin)
Online ISSN: 2244-5226

To cite this paper: Sotto, R.C., Bautista, N.S., Masungsong, L.A., Estrella, F.A.C., Telan, J.A.J.B. & San Pascual, A.O. 2022. Morphological and Physiological Responses of Mango (*Mangifera indica* L.) to Drought Stress and Drought Alleviation Strategies During Early Seedling Stage. *Journal of Nature Studies*, 21(2), 47-57.