

## Abstract

Plant polyphenols have gained prominence in quality of plant products and in human health. An experiment was conducted to determine the association of tea polyphenols with water stress and their suitability as indicators for drought tolerance. The experiment was conducted in a 'rain-out' shelter, and consisted of six tea clones (BBK 35, TRFK 6/8, TRFK 76/1, TRFK 395/2, TRFK 31/30, and TRFK 311/287) and four levels of soil water contents (38, 30, 22, and 14% v/v), which were maintained for a period of 12 weeks. The treatments were arranged in a completely randomized design and replicated three times. Plant growth was monitored over 6 weeks, and a water stress index was calculated to determine water-stress tolerant clones. Total polyphenols in tea shoots was analyzed and a regression analysis done. The results indicate that declining soil water content (SWC) reduced both growth and content of polyphenols in tea. Tolerant clones maintained a high polyphenol content at low SWC, and also showed less fluctuation in phenolics when subjected to changes in SWC. There was significant ( $P < 0.001$ ) correlation of total polyphenol content with shoot growth and WSI of tea, and a linear relationship ( $r^2 = 0.97$ ) between SWC for tea and both, water stress index and shoot polyphenol content. We report that there is a potential to use polyphenols as indicators for selection of drought-tolerant tea cultivars.