Flowering Response of *Bougainvillea* × *buttiania* ‘Afterglow’ to drought stress

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Figure 1. Bougainvillea exhibiting non-synchronous flowering within the same microclimate

Introduction

Bougainvillea is one of the most common and defining landscape shrubs in tropical parts of the world. It is a short-day, flowering ornamental woody shrub that is valued for its ability to thrive under harsh urban conditions[1] (subject to compaction, pollution, drought, etc). However, it exhibits an unpredictable and often non-synchronous flowering pattern, especially when there is a lack of distinct variation in photoperiod, such as in the true tropics. One horticultural practice used to induce flowering is to subject the plants to slight drought stress[2]. However, little research has been done to identify the reason why this seems to trigger flowering, or if indeed it does trigger flowering at all. The objective of this study was to evaluate different levels of drought stress and their impact on the flowering of one cultivar of Bougainvillea.

[1]Ma S, Gu M. 2010. Effects of water stress and selected plant growth retardants on growth and flowering of ‘Raspberry Ice’ bougainvillea (*Bougainvillea spectabilis*), XXVIII Int Hortic Congr Sci Hortic People IHC2010 Int Symp 937; p. 237–242.

[2]Schoellhorn R, Alvarez E. Warm Climate Production Guidelines for Bougainvillea.

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Materials & Methods

Thirty-five rooted *Bougainvillea* x *glabra* ‘Afterglow’ cuttings were grown in a 50% perlite : 50% coir media with 12g of Osmocote® 10-10-10. They were pruned to the same height and grown under 14-hour photoperiod with temperature set at constant 25°C. Cuttings were subjected to seven levels of water stress (A=50mL upon wilting, B=25mL/2days, C=25mL/1day, D=50mL/2days, E=50mL/1day, F=100mL/1day, Standing water) where A=very high, B= high, C and D=medium, E=low, F=very low, and G=saturation. Stomatal conductance was measured using a leaf porometer (Decagon Devices, model SC-1) as a proxy of water stress. The number of flower buds on each plant was counted at the end of 6 weeks. Pour-through leachate was analyzed for N-P-K levels.

Figure 2. (1) cuttings pruned to uniform height and kept under long-day photoperiod for 3 weeks prior to experiment, (2) cuttings transferred to climate-controlled growth chamber under long-day conditions, (3) vegetative buds and (4) flower buds on replicates.

Results

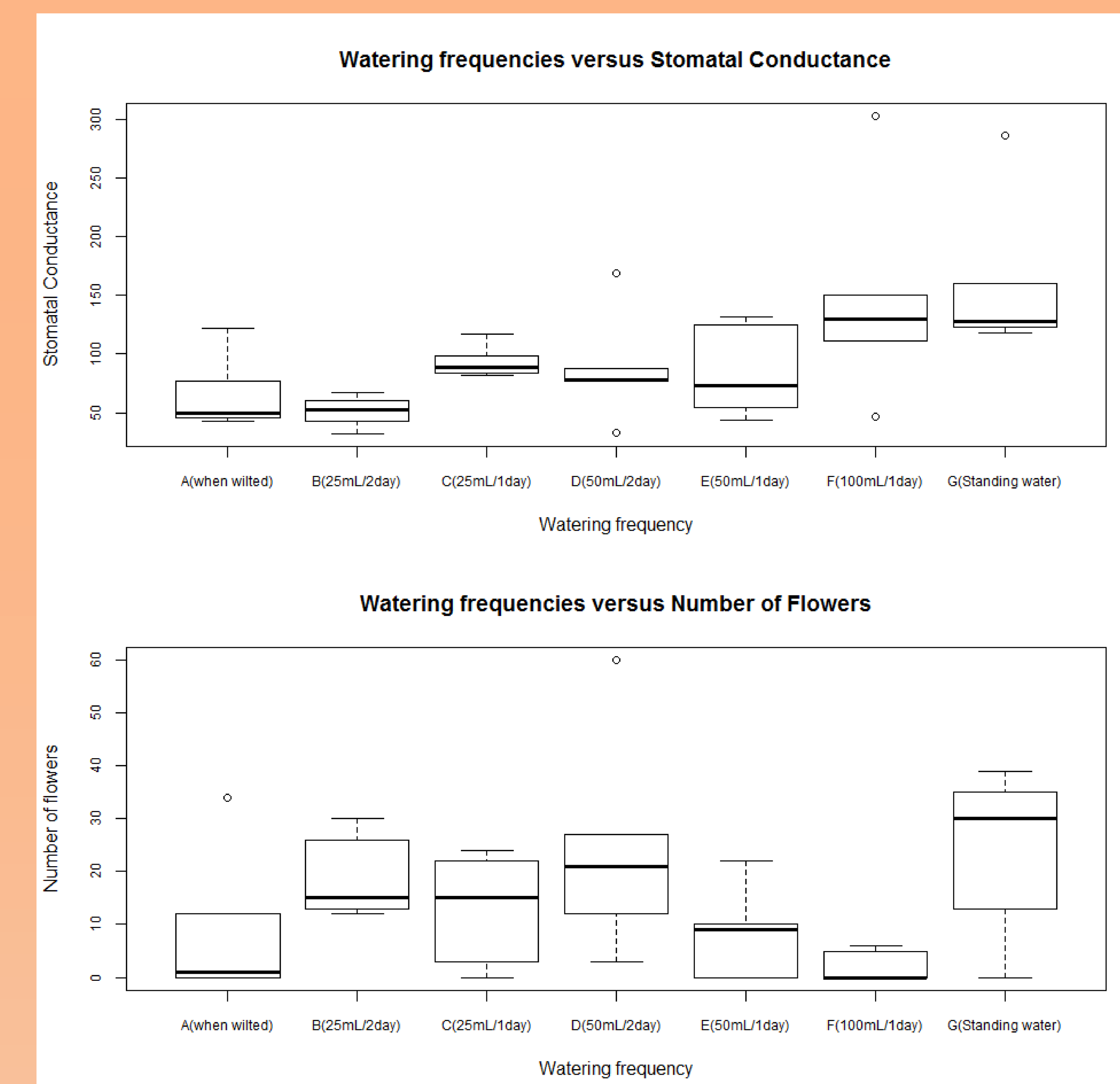

Figure 3. (upper) boxplot of treatments versus stomatal conductance as measured by leaf porometer , (lower) boxplot of treatments versus number of flowers produced after 6 weeks

Plants grown under medium water stress produced more flowers than those under low or high water stress. These results support published findings that watering in between periods of medium water stress induces flowering in spite of long-day conditions. N-P-K levels were significantly different between treatments ($p<0.05$) probably due to the use of controlled-release fertilizer, but did not have any correlation to the number of flowers. Plants grown in standing water were expected to fail due to root rot, but surprisingly were the earliest to flower, and produced the highest mean number of flowers. The anaerobic stress of saturated root-zone may have contributed to the flowering response, which warrants further investigation of the relation between stress hormones and their role in flowering responses.