Editor in Chief of AoB Plants

Sydney, 24th June, 2015

Dear Dr. X,

Please find enclosed our manuscript **“Interactive effects of waterlogging and atmospheric CO2 concentration on gas exchange, growth and functional traits of Australian riparian tree seedlings”**, which we have submitted for consideration as a Standard Research Paper in *AoB Plants*.

Waterlogging is a dominant stress on plants in riparian environments, and the morphological and physiological mechanisms by which plants respond to soil waterlogging have been well characterised. While elevated atmospheric concentrations of CO2 (eCO2) are known to have a stimulatory effect on plant growth and physiology, the potential for interactive effects of waterlogging and rising atmospheric levels of CO2 on plants is largely undescribed.

In this study, we were interested in whether eCO2 could mitigate waterlogging stress. We used a manipulative glasshouse experiment to investigate how seedling gas exchange, growth, biomass allocation and functional traits of three riparian tree species were affected during and following recovery from waterlogging, under ambient (390 ppm) and elevated (550 ppm) atmospheric concentrations of CO2.

Responses to treatments varied between species, but no mitigating effect of eCO2 on waterlogging growth impairment was found. For one species, however, we found that a strong stimulation of growth under eCO2 was completely nullified in response to waterlogging, and remained so even following a recovery period. These inter-species inconsistencies in waterlogging/eCO2 responses may have meaningful implications for the composition and ecosystem functioning of riparian plant communities.

We believe our findings make a novel contribution to what is currently a very small pool of literature describing the combined effects of waterlogging and eCO2 on plants.

We confirm that this manuscript is original and is not published or under consideration for publication by any other journal. If you feel this contribution is appropriate for your journal, we suggest the following referees:

Patrick Megonigal

Laura Perry

TD Colmer

We submit this cover letter, the manuscript, 3 figures and 2. James Lawson is the corresponding author, and email is the preferred form of contact.

Yours sincerely,

James Lawson  
Department of Biological Sciences