Interactions between the native *Azolla filiculoides* and exotic *Salvinia molesta*

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Summary Competition between freshwater plant species that occupy similar positions in the water column tends to be more intense relative to that between plants which grow in different parts of the water column. However, the ongoing environmental and climate change might modify the competitive interactions between such species. Using an environmentally controlled glasshouse experiment, we investigated the effect of CO2 and nutrient enrichment on competition between two free-floating fern species that co-occur in south-eastern Australia - native *Azolla filiculoides* and invasive exotic *Salvinia molesta*. The species were grown in monoculture and competition in nutrient cultures that were replaced weekly to simulate a dynamic system. We hypothesised that resource enrichment will enhance relative growth rates (RGR) of both species. We further hypothesised that although RGR of both species will be suppressed under competition relative to their counterparts grown in monoculture, *S. molesta* will be the dominant species in the competition treatment. We found that the relative growth rate (RGR) of both species was greater under high resource conditions as hypothesised. Surprisingly, competition did not result in suppression growth in either of the species. On the contrary, *A. filiculoides* had a facilitative effect on *S. molesta*. In addition, *A. filiculoides* gained more biomass under high resource conditions relative to *S. molesta* and the opposite was true under low resource conditions. We conclude that CO2 and nutrient concentration did not mediate competition between the species but instead influenced RGR independent of competition. These findings suggest that species composition in dynamic water bodies under future environmental conditions may be determined by the species' responses to environmental changes rather than by changes in competitive interactions.

Keywords Atmospheric CO2, competition, nutrient enrichment, relative growth rate