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## **A29. Effect of increased CO<sub>2</sub> and temperature on growth, photosynthesis and lipid content of tropical *Chlorella***

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Elevated temperature and carbon dioxide (CO<sub>2</sub>) level are some of the factors causing global warming. Very little is known about how global warming will affect the tropical microalgae. The aim of this study was to investigate the temperature and CO<sub>2</sub> sensitivity of the photosynthetic process of two tropical *Chlorella* species (*Chlorella vulgaris* UMACC 001 and *Chlorella* UMACC 014). We grew the cultures of the two *Chlorella* species under four conditions: (1) 28°C and 375ppm CO<sub>2</sub> (control), (2) 28°C and 750ppm CO<sub>2</sub> (high CO<sub>2</sub>), (3) 32°C and 375ppm CO<sub>2</sub> (high temperature), and (4) 32°C and 750ppm CO<sub>2</sub> (combined factors). Elevated temperature and CO<sub>2</sub> level stimulated the growth of both *Chlorella* species, except for *Chlorella* UMACC 014 where there was

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no marked difference on the growth when grown under control and high temperature conditions. The optimum growth condition for *Chlorella vulgaris* UMACC 001 was at 32°C + 750ppm CO<sub>2</sub> at light intensity of 601 μmol photons m<sup>-2</sup> s<sup>-1</sup>. Elevated CO<sub>2</sub> condition stimulated the production of carotenoid and lipid in both *Chlorella* species. In general, the growth and physiology of both tropical *Chlorella* species showed a much greater positive response to elevated CO<sub>2</sub> and temperature.