

## **Effects of light on phytochemical contents of Brassica rapa under controlled environments**

### **ABSTRACT**

Plant growth is predominantly influenced by light, and light intensity is manipulated in indoor farming to allow for mass production. The light-emitting diode (LED) is the most practical artificial light, capable of improving crop quality and making indoor agricultural systems more sustainable. Despite their consistent growth under artificial light, little is known about how light intensities and spectrums affect secondary metabolites in commonly grown Brassica species. This study aimed to compare the metabolite profiles of Brassica rapa (Chinese cabbage) grown under natural light to those grown under different artificial light intensities and spectrums using gas chromatography-mass spectrometry (GC-MS). Although the biochemical composition of B. rapa was comparable under varied light conditions, exposure to magenta and red spectrums produced neophytadiene and myristic acid, respectively, whereas exposure to natural light produced squalene and sulfurous acid. Neophytadiene and myristic acid are antioxidants and flavour enhancers, respectively; whereas squalene and sulphurous acid are involved in odour production and function as disinfectants in plants. As a result, these findings add to our understanding of how light conditions can be controlled to improve the growth and biochemical composition of B. rapa, thereby enhancing the palatability of indoor farming.