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Identification of novel photocytotoxic plant secondary metabolites in the pasture legume *Biserrula pelecinus* L.

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Biserrula pelecinus L. is an annual legume native to the southern Mediterranean. It was first introduced to Australia in 1991 as a potentially valuable rotational pasture species for livestock production. It produces large quantities of biomass, exhibits drought tolerance and is effective for weed suppression in pasture rotations. However, despite proving to be a valuable addition to the pasture toolbox, producers in NSW and WA have reported a limiting factor to uptake: Incidence of severe photosensitization when grazing sheep on *Biserrula* pastures. *Biserrula* photosensitivity, anecdotally, appears to be associated with non-senescent foliage and shows an increased severity of clinical signs in young animals grazing green tissues; however, the pathogenesis of this photosensitization and the metabolites responsible are, as yet, unknown. Studies reported in this project have identified that both commercially available cultivars of *Biserrula*, 'Casbah' and 'Mauro' can cause outbreaks of primary photosensitization. This work identified that fresh foliar extracts were photosensitizing and that this activity diminished greatly with drying. Both cultivars were found to be equally bioactive and photocytotoxic activity was associated with extracts from field-grown *Biserrula* at all stages of plant growth until senescence. Biochemical analysis using fractionated extracts, bioactivity-guided metabolic profiling using liquid chromatography mass spectroscopy and quadripole time-of-flight (UPLC/MS-QToF) analysis has resulted in identification of multiple novel molecular features with high statistically significant likelihood of causal compounds present in both the complex crude extract and the purified bioactive fractions. The process undertaken to define the etiology of *Biserrula* photosensitization and identification of bioactive phototoxic secondary metabolites, will be presented.

Biography

Jane C Quinn is the Founder of a multidisciplinary research team at Charles Sturt University which investigates the etiology, activity and mode of actions of chemicals, both naturally-occurring products and synthetic compounds, which cause toxic outbreaks in domestic and native animals. Her research focuses on neuroactive and photocytotoxic compounds and disease outbreaks caused by ingestion of toxic plants in domestic livestock. With an extensive background in neuroscience research she also advises veterans and government agencies on the effects of neurotoxic chemicals in veterans, with a special interest in members of the quinolone family of anti-malarials. She is currently based at Charles Sturt University in rural New South Wales, Australia.

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