

LC-MS/MS ANALYSIS OF INDOLEDITERPENOIDS OF GRASS ENDOPHYTES

Karl Fraser¹, Brian A. Tapper², Sarah Finch³, Millie Yu¹, Albert Koulman¹ and Geoffrey A. Lane¹

¹*Forage Biotechnology Section, ²Forage Improvement Section, Grasslands Research Centre, AgResearch Ltd, Palmerston North, New Zealand, and ³Forage Improvement Section, Ruakura Research Centre, AgResearch Ltd, Hamilton, New Zealand.*

“Ryegrass staggers” of livestock grazing perennial ryegrass pastures infected with common strains of the fungal endophyte *Neotyphodium lolii* has been attributed to the tremorgenic fungal indolediterpenoid lolitrem B. Strains of *N. lolii* and related species have been selected for the absence of lolitrem production *in planta* and introduced into pasture cultivars. This approach has been successful and has been shown to reduce or eliminate “ryegrass staggers”. However, other indolediterpenoids may be produced by these strains and while HPLC-fluorescence analysis methods have proved a valuable tool for indolediterpenoid analysis a more comprehensive analytical approach was required to provide a broader view of the indolediterpenoid accumulation in herbage of grasses infected with selected fungal strains.

A wide range of indolediterpenoids are amenable to analysis by reverse-phase HPLC- APCI and ESI MS/MS. Selective reaction monitoring methods provide good sensitivity for a wide range of indolediterpenoids with comparable or greater sensitivity than by fluorescence detection. In addition, the collision-induced fragmentation patterns provide useful characterising information when unknown compounds are encountered. Results of HPLC-MS/MS analyses of a range of endophyte-infected grasses, and of collision-induced fragmentation of indolediterpenoids will be presented and discussed. The method provides a valuable tool for the investigation of endophyte metabolism, and for quality assurance in the development and commercial release of selected endophyte strains.