Sequential spectral changes of Meloidogyne enterolobii-infected plants using two dimensional correlation IR spectroscopy

Abstract

In this work, we found that tomato and guava plants infected with Meloidogyne enterolobii showed different Fourier-transformed infrared spectral patterns compared to non-infected plants. Additionally, by using two-dimensional correlation spectroscopy (2D-COS) we were able to track and explain those spectral differences according to the progression of the nematode infection in the plants. In general, 2D-COS reveals the same chain of changes in both tomatoes and guavas when under nematode infection. There is a decrease in bands representing amino acids and proteins, fatty acids and lipids are down-regulated, and sugars and total phenols increase in leaves of infected plants. The application of this technique provides useful information on the metabolic and biochemical changes in plant tissues when diseased in a rapid manner. This technique could be used in the future, combined with other methods, to improve field diagnosis, quality control, or to reduce analytical time for biochemical purposes.