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Development of DNA based methods for detection and characterization of nematode species affecting agricultural crops

Ditylenchus species like *D. dipsaci*, *D. destructor*, *D. gigas* and *D. angustus* are important internationally-regulated pests of several crops. The goal of this project was to increase the understanding of diversity within the genus *Ditylenchus*, particularly for the most widely-distributed species *D. dipsaci* and *D. destructor*. 18S rRNA sequences were generated for new isolates of *D. destructor* or *D. dipsaci* obtained from a variety of crops and soils from across the US and several international sites. Sequences generated in this study were combined with sequences available from public databases to produce a detailed phylogeny for the genus *Ditylenchus* and several related genera. Our results show that the 18S rRNA is sufficient for distinguishing *Ditylenchus* from genera often found in soil samples that might be mistaken morphologically for *Ditylenchus* and for discriminating between most *Ditylenchus* species. The results also show that the *D. dipsaci* and *D. destructor* species groups are more diverse than previously described. The presence of several well resolved branches that lack member sequences from public databases suggests there are yet to be described species of *Ditylenchus* present in agricultural fields. We also observed that *Ditylenchus* populations isolated from infected plants were often clonal while populations from soil samples were usually more diverse and often included other genera that were morphologically similar to *Ditylenchus* and of no regulatory significance. These results indicate that DNA based methods allow rapid and accurate identification of *Ditylenchus* species of regulatory importance that could potentially be applied to improve agricultural and regulatory practices.

Biography

Stephen F Hanson has completed his PhD in Plant Pathology from the University of Wisconsin at Madison in 1997 studying mechanisms of Geminivirus replication. Following Post-doctoral work in Molecular Virology and Viral Oncology he has held a Faculty Position in Molecular Plant Pathology at New Mexico State University. His current research includes molecular and biotechnology work on viruses, fungi, prokaryotes and nematodes affecting agricultural production.

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