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CHARACTERIZATION OF INTRASPECIFIC VARIATIONS OF BELONOLAIMUS LONGICAUDATUS BY MORPHOMETRY, DEVELOPMENT, AND SEQUENCE ANALYSIS OF ITS-1 IN rDNA

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Sting nematode, Belonolaimus longicaudatus, is one of the most important plant parasitic nematode in the southeastern United States. To determine the intraspecific variations of sting nematode, five different isolates were collected from different geographical locations and hosts. In Florida, Hastings (HA) isolate came from potato, Gainesville (GV) isolate from bermudagrass, and Lake Alfred (LA) isolate from citrus. Other isolates came from Georgia(GA) (cotton in Tifton, GA) and North Carolina(NC) (corn in Scotland Co., NC). Each isolate was characterized by morphology, development, host specificity, and ITS-1 rDNA sequence analysis. Additional isolates, Nebraska (NB) and Texas (TX) were added later for ITS-1 sequence analysis.

In female morphology, both LA and NC isolates were larger in body length and tail length ($P < 0.05$). The LA isolate was differentiated from the NC isolate with longer stylet length. However, GV isolate had the smallest stylet length as well as the smallest body length among all isolates of sting nematode

($P< 0.05$). The time required for development from egg to adult was compared by the observations of nematodes cultured on excised corn root in Gamborg B-5 medium. At 28 °C, GA isolate completed the development within 17 days, and HA and GV isolates finished in 19, and 18 days, respectively, whereas NC isolate showed the longest developmental time of 25 days, and LA isolate also showed comparatively slow development time with 22.5 days. Based on phylogenetic analysis of ITS-1 in rDNA, GA, HA, and NC isolate were not distinctively divergent in tree topology. However, GV isolate was determined as a ancestor group of HA, LA, GA, and GV isolates of sting nematodes, which was consistent in both neighbor joining tree, and maximum parsimony tree. LA isolates also was diverged earlier than GA, HA, and NC isolate based on neighbor joining tree. TX, NB, and SC isolates were very closely related to each other, but completely differentiated from all Florida, Georgia, and North Carolina isolates.