Kansiree Jindapunnapat 2012: Development of the Molecular Markers for Species Identification of Root-Knot Nematode Infesting Guava in Thailand. Master of Science (Plant Pathology), Major Field: Plant Pathology, Department of Plant Pathology. Thesis Advisor: Mr. Buncha Chinnasri, Ph.D. 84 pages.

Nakhon Pathom and Samut Sakhon provinces are important guava cultivating areas in the central region of Thailand where the guava trees have widely been infected by root-knot nematodes (*Meloidogyne* spp.). Soils were collected from the six orchards as follows: Thaveesak (TV), Khlongjida (KJ), Payoon (PY), Apinya (AP), Namthan (NT), and Khlongton (KT). Tomato plants (cherry cultivar) were planted in the collected soils which had been mixed with sterile soils (3 samples/ orchard). Second-stage juveniles (J2) were hatched and randomly selected at about 20 J2/sample. Consequently, the size and other morphological characteristics of J2 were measured. The results demonstrated that L values of the J2 were lower than the standard value but not a value, c value, and h value which were almost similar to the standards. The examination of the perineal patterns of the adult females of root-knot nematodes reaffirmed that there were two *Meloidogyne* species infecting guava roots. *M. incognita* was found in TV, KJ, and AP orchards whereas *M. enterolobii* (the species never reported in Thailand) existed in NT, PY, and KT orchards. Guava roots infected by *M. enterolobii* showed heavy galls. The females had transparent bodies. The males were present in a high number. To ensure correct identification of the species of nematodes, the molecular techniques based on esterase phenotypes and molecular markers using the following sets of primer marker 1108: 5'-TACCTTTGACCAATCACGCT-3' and C2F3: 5'-GGTCAATGTTCAGAAATTTGTGG-3' were conducted. The results demonstrated that root-knot nematodes collected from NT, PY, and KT orchards had *M. enterolobii* esterase phenotype, VS1-S1, as compared to J1, I1, and F1 phenotypes in *M. javanica*, *M. incognita*, and *M. konaensis*, respectively. The size of DNA bands amplified from nematode samples in NT, PY, and KT orchards was approximately 700 bp, as compared to 1,700 bp in *M. incognita* and *M. javanica*. Development of a molecular marker only specific to the genus *Meloidogyne* was undertaken. The PCR-based technique using the primer set of UNI_16sM and UNI_COIIM yielded an amplicon of approximate 400 bp and 150 bp, respectively, only on *Meloidogyne* samples, but not on *Pratylenchus*, *Rotylenchulus*, *Helicotylenchus*, *Aphelenchus*, and *Steinernema*. For a molecular marker specific to all nematodes in the Phylum Nemata, the PCR product of an approximate 1 kb derived from DNA amplification using the primer Nema_18s was found.

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