Chotiros Rodkate 2012: Variation of *Colletotrichum gloeosporioides* causing chilli anthracnose. Master of Science (Plant Pathology), Major Field: Plant Pathology, Department of Plant Pathology. Thesis Advisor: Associate Professor Ratiya Pongpisutta, Ph.D. 144 pages.

Morphological characteristics of fifty-eight *Colletotrichum gloeosporioides* isolates causing chilli anthracnose collected from Chiang Mai, Chiang Rai, Kanchanburi, Khon Kaen, Nakhon Pathom, Nakhon Ratchasima, Nakhon Sawan, Phetchabun, Phitsanulok, Prachuap Khiri Khan, Si Sa Ket, Sukhothai, Ubon Ratchathani and Udon Thani were studied. Based on colony characteristics were divided into 8 groups. Using conidial shapes were clustered into 3 groups.

However, *C. gloeosporioides* represented highly variation in morphology, hence molecular marker technique was required. Polymerase chain reaction (PCR) analysis of the ribosomal DNA (ITS1-5.8s-ITS2 region) with species-specific primer *Cg*Int in combination with the universal primer ITS4 was investigated to establish the identify of *C. gloeosporioides*. From this result, *Cg*Int/ITS4 was positive for all isolates of *C. gloeosporioides*, a fragment of approximately 450 bp was obtained. Three restriction enzymes, *Hae*III, *Pvu*II and *Eco*RI were used. All data were used to construct an UPGMA dendrogram by NTSYS pc 2.20e. There were 2 groups of *C. gloeosporioides* at 70% of DICE similarity with bootstrap value indicated 86%. The dendrogram revealed that group 1 comprised of isolates from Chiang Mai, Si Sa Ket, Nakhon Pathom, Nakhon Sawan, Phitsanulok, Phetchabun, Khon Kaen, Ubon Ratchathani and Prachuap Khiri Khan. Moreover, no genetic variation detected within four isolates of Phetchabun. Also, inter-simple sequencerepeat (ISSR) analysis was examined using 4 primers as (CAG)5, (GTG)5, (GACA)4 and (TGTC)4. (CAG)5 generated 14 bands from 400-1500 bp. (GTG)5 was found to produce 14 bands also with 400-1300 bp. Whilst (GACA)4 and (TGTC)4 showed amplified products with 10 bands generating fragments from 500-1300 and 500-1800 bp, respectively. All data were constructed by UPGMA cluster analysis with NTSYS pc 2.20e. Fifty-eight isolates were separated into 6 clusters at 50% of DICE similarity. DNA sequencing was revealed that CM039 with DNA size at 325 bp distinguished from NKP018, NKS140, SKT046 and SSK020 at 441, 439, 449 and 442 bp, respectively.

Cultural maintenance was studied using potato carrot agar (PCA) and sterile distilled water preservation for 12 months. Variation of colony types and conidial shapes were revealed while no variation occurred in setae and appressoria characteristics. Most isolates of *C. gloeosporioides* on PCA showing growth rate and spore germination were greater than isolates in sterile distilled water. Pathogenicity test was investigated on chilli fruits cv. Jinda. Forty two isolates maintained on PCA and seven isolates preserved in sterile distilled water showed 100% of disease incidence. Whilst, nine isolates maintained in sterile distilled water lost pathogenicity. SSK049 showed the greatest results in 100% of disease incidence before and after preservation by 2 methods and also in disease severity evaluated by inoculating on chilli fruits before and after preservations on PCA and in sterile distilled water with 14.89, 10.21 and 7.23% of diseased areas, respectively.

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