

Amnat Eamvijarn 2013: *Neosartorya* species: Diversity, Morphology, Phylogeny, Antagonistic Tests Against Plant Pathogenic Fungi and Secondary Metabolites of *N. pseudofischeri*. Doctor of Philosophy (Plant Pathology), Major Field: Plant Pathology, Department of Plant Pathology. Thesis Advisor: Professor Leka Manoch, Ph.D. 204 pages.

Two hundred and forty-nine soil samples were collected from 16 provinces in Thailand during October 2008 to May 2009. The alcohol, heat treatment methods and Gochenaour's glucose ammonium nitrate agar were employed. Identification of fungal isolates was based on morphological characteristics as colony growth pattern, color and texture on standard media. *Aspergillus* anamorphic state and ascospore ornamentation were examined under light, stereo and scanning electron microscopes. Camera lucida drawing was made. Two hundred and forty-eight isolates of *Neosartorya* species were found including 7 known species, 1 new species and 3 unidentified species comprising *Neosartorya fischeri*, *N. glabra*, *N. laciniosa*, *N. pseudofischeri*, *N. siamensis* sp. nov. (KUFC 6349), *N. spinosa*, *N. takakii*, *N. tatenoi*, *Neosartorya* sp.1 (KUFC 6341), *Neosartorya* sp.2 (KUFC 6513) and *Neosartorya* sp.3 (KUFC 6579). *Neosartorya siamensis* was a new species, whereas *N. laciniosa* and *N. pseudofischeri* were new records to Thailand. *Neosartorya spinosa*, *N. fischeri*, *N. glabra*, and *N. siamensis* were the dominant species found in forest and agricultural soil. The validation of new species as well as the other four *Neosartorya* spp. were supported by analyses of the  $\beta$ -tubulin gene sequences.

*In vitro* Antagonistic activity test of 9 *Neosartorya* species against 9 species of plant pathogenic fungi showed that *Neosartorya fischeri* inhibited 53.9-58.3% of radial growth of *Fusarium oxysporum*, *Alternaria brassicicola*, *Colletotrichum capsici* and *Curvularia oryzae*. *Neosartorya tatenoi* provided of 62.2 and 51.1% growth inhibition of *Phytophthora palmivora* and *Pythium aphanidermatum*. However, 9 *Neosartorya* spp. could not inhibit *Rhizoctonia oryzae* and *Sclerotium rolfii*. The efficacy of 6 *Neosartorya* spp. crude extracts revealed that *Neosartorya fischeri* at 1,000 ppm completely inhibited mycelial growth of *Pythium aphanidermatum*, *Phytophthora palmivora* and *S. rolfii*, whereas the other 5 *Neosartorya* species and *N. fischeri* at 10,000 ppm strongly suppressed 100% mycelial growth of 8 species of plant pathogenic fungi, but failed to control *Lasiodiplodia theobromae*.

For inhibitory activity of 6 *Neosartorya* crude extracts on weed seed germination and growth inhibition, *Neosartorya pseudofischeri* at 10,000 ppm showed the strongest germination and growth inhibition on *Phaseolus lathyroides* L. at 91.6% and 81.0% respectively, whereas *Neosartorya siamensis* sp. nov. (KUFC 6349) at 10,000 ppm showed the strongest seed germination and growth inhibition on *Mimosa pigra* L. and *Corchorus* sp. at 98.7% , 86.3% and 100% , 99.3% respectively.

For secondary metabolites investigation, four known compounds including cadinene, eurochevalierine, brasiliamide B, and pyripyropene A and three new compounds including a 1,4-diacetyl-2,5-dibenzylpiperazine 3,7''-oxide, pseudofischerine, and 2,4-dihydroxy-6-methylbenzoic acid were isolated from the fungus *Neosartorya pseudofischeri* KUFC 6422. Eurochevalierine displayed *in vitro* growth inhibitory activity in six human cancer cell lines.

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Thesis Advisor's signature