

Rungluk Kaewwichian 2009: Diversity of Yeast in Forest Soil in the North Eastern Part of Thailand and Their Ability in Degradation of Organic Compounds. Master of Science (Microbiology), Major Field: Microbiology, Department of Microbiology. Thesis Advisor: Professor Savitree Limtong, D.Eng. 137 pages.

Diversity of yeast in forest soils from 2 wildlife sanctuaries, 9 national parks, 3 forest parks and 8 other forests in the north-eastern part of Thailand was studied. Yeast strains were isolated using enrichment technique and identified on the basis of sequences analysis of the D1/D2 domain of the large subunit rRNA gene and phylogeny. A total of 102 yeast strains were obtained from 60 soil samples. Eighty-one strains were identified to be 32 ascomycetous yeast species namely *Candida akabanensis*, *C. diversa*, *C. ghanaensis*, *C. glabrata*, *C. nivariensis*, *C. orthopsilosis*, *C. pararugosa*, *C. pseudolambica*, *C. rugosa*, *C. saopaulonensis*, *C. tropicalis*, *Debaryomyces hansenii* var. *fabryi*, *D. nepalensis*, *D. vanriijiae* var. *vanriijiae*, *Geotrichum fragrans*, *G. vulgare*, *Kazachstania aquatic*, *K. bovina*, *K. siamensis*, *K. unispora*, *Kluyveromyces hubeiensis*, *Kodamaea ohmeri*, *Pichia caribbica*, *P. galeiformis*, *P. kluyveri*, *P. kudriavzevii*, *P. occidentalis*, *P. pijperi*, *Tetrapisispora namnaoensis*, *Torulaspora globosa*, *Williopsis saturnus* var. *mrakii*, *W. saturnus* var. *sargentensis* and *Zygosaccharomyces fermentati*. One strain was belonged to basidiomycetous yeast, *Tricosporon mycotoxinivorans*. Twelve strains were found to be similar to six undescribed species i. e. *Candida* sp. ST-533, *Pichia* sp. ST84, *Geotrichum* sp. CICC1364, *Geotrichum* sp. MTCC 3974, *Pichia* sp. RV60 and *Torulaspora* sp. WB17 whereas the other six strains could be identified as known or new species. Moreover, two strains were identified to be two novel species. In this report, four new species were proposed on the basis of polyphasic taxonomy. *Candida mokdahanensis* sp. nov. and *Geotrichum phurueaensis* sp. nov. were proposed from two strains which were found to be new species while *Candida asiaensis* sp. nov. and *Candida sekii* sp. nov. were proposed from the strains similar to undescribed species. Results revealed high diversity of yeasts in forest soils from the north-eastern part of Thailand, especially yeasts in the genus *Candida* were found as many as 15 species whereas *Kazachstania siamensis* was the most frequently isolated species. Degradation of cellulose xylan and starch by the isolated yeast strains was investigated. The ability to hydrolyze microcrystalline cellulose and carboxyl methyl cellulose were found in nine species i. e. *Candida glabrata*, *C. nivariensis*, *C. pararugosa*, *Torulaspora globosa*, *Williopsis saturnus* var. *mrakii*, species similar to *Candida* sp. ST-533, species similar to *Torulaspora* sp. WB17, *Candida mokdahanensis* sp. nov. and *Candida sekii* sp. nov. whereas six species namely *Candida orthopsilosis*, *Kazachstania aquatic*, *K. unispora*, *Kodamaea ohmeri*, *Pichia caribbica* and *Zygosaccharomyces fermentati* were found to hydrolyze carboxyl methyl cellulose only. Xylan degrading ability were observed in four species named *Candida pararugosa*, *Torulaspora globosa*, *Candida sekii* sp. nov. and species similar to *Torulaspora* sp. WB17 as well as five species, *Candida pseudolambica*, *Geotrichum fragrans*, *Pichia sporocuriosa*, *Trichosporon mycotoxinivorans* and species similar to *Geotrichum* sp. MTCC 3974, were found to hydrolyze starch.

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Thesis Advisor's signature