

CONCLUSIONS

A total of 342 isolates of *Talaromyces* were obtained from soil, comprising 13 species and 1 varieties including *Talaromyces austrocalifornicus*, *T. bacillisporus*, *T. flavus*, *T. macrospermus*, *T. helicus* var. *major*, *T. indigoticus*, *T. luteus*, *T. rotundus*, *T. stipitatus*, *T. trachyspermus*, *T. wortmannii*, *Talaromyces* sp. 1 (KUFC 3399) and *Talaromyces* sp. 2 (KUFC 3383). *Talaromyces austrocalifornicus* and *T. indigoticus* are new records for Thailand.

Talaromyces flavus and *T. macrosporus* were the dominant species followed by *T. stipitatus*, *T. trachyspermus*, *T. wortmannii*, *T. bacillisporus*, *T. rotundus*, *T. indigoticus*, *T. helicus* var. *major*, *T. austrocalifornicus*, *T. luteus*, *Talaromyces* sp. 1 (KUFC 3399) and *Talaromyces* sp. 2 (KUFC 3383).

Phylogenetic analyses were conducted using polymorphic microsatellites of 21 fungi comprising 18 species of *Talaromyces* and 3 other Trichocomaceae (KUFC 3576, 5642, 5655) from Kasetsart University Culture Collection isolated in Thailand. The results showed that the *Talaromyces* used in this study did not show any congruence to the division either done by Stolk and Samson, 1972 or Pitt, 1979. The unidentified species, *Talaromyces* sp. 1 (KUFC 3399) was found on same clade with *T. roduntus* which occupies a basal position to the main *Talaromyces* clade and both of them belong to the Series *Lutei*.

The antagonistic activity tests revealed that 20 isolates of *T. flavus* effectively inhibited mycelial growth of *Phytophthora palmivora*, *P. parasitica*, *Helminthosporium maydis*, *H. oryzae*, *Fusarium oxysporum*, *Colletotrichum capsici*, and *C. gloeosporioides*. However, little inhibition was observed for *Pythium aphanidermatum*, *Lasiodiplodia theobromae*, *Rhizoctonia solani* and *Sclerotium rolfsii* *in vitro*. The greenhouse experimental indicated that 20 isolates of *T. flavus* could control *Sclerotium rolfsii*, stem rot of mungbean 7 and 14 days inoculation. However only 6 isolates of *T. flavus* could inhibit *S. rolfsii* at 30 days after inoculation.

For secondary metabolites investigation, the oligophenalenone dimer duclauxin and two new analogues, bacillisporins D and E, were isolated from *Talaromyces bacillisporus* in addition to the previously reported bacillisporins A, B and C.

Chemical study of an unidentified *Talaromyces* sp. 1 (KUFC 3399), furnished the two new merodrimanes thailandolides A and B, an *O*-methylated derivative of the aromatic fragment incorporated in thailandolide B, and three known closely related 1(3*H*)-isobenzofuran derivatives, penisimplicissin, vermistatin, and hydroxydihydrovermistatin. Structures were established by spectroscopic measurements and confirmed by X-ray analyses of compounds thailandolides A and vermistatin. The unusual peptide analogue *N*-benzoylphenylalanyl-*N*-benzoylphenylalanine isolated earlier from a higher plant was also found.