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**ABSTRACT**

One hundred and twenty isolates of straw mushroom (*Volvariella volvacea* (Bull. ex. Fr.) *Sing*) in Thailand were collected to study on genetic diversity in this study. The isolates were derived from natural habitat 43 isolates and commercial varieties 77 isolates. The result showed that among mushroom isolates tested are different in phenotype, based on hyphal morphology, growth ability and chlamydospore production on synthetic medium (PDA). All isolates were classified into 3 groups based on hyphal morphology and growth on PDA, which were rapid, medium and low growth rate. However, when hyphal density and chlamydospore production were considered, they were divided into 2 groups, dense and flat mycelium; produced and not produced chlamydospore. In the producing chlamydospore group, it was divided into 3 sub-groups as followed: dense and compact hyphae, red-brown pustule and white pustule. Most of natural habitat isolates produced chlamydospore except isolate WM1601 while a commercial isolate CB1201 and CSk1101 produced chlamydospore. The result of potential fruiting body production of 120 isolates of straw mushroom showed that, 75 isolates could produce fruiting body with different biological efficiency (B.E.) percentage ranking 2.00 – 21.16 and the fruiting body related with chlamydospore production on compone.

DNA fingerprint of straw mushroom by amplified ribosomal DNA restriction analysis (ARDRA). The specific primers for ITS1 – 5.8S – ITS2 region were used and multiplied this region by PCR technique, followed by digestion with restriction endonucleases; *AluI, EcoRI, HinfI, HpaII, MboI, TaqI* and six random amplified polymorphic DNA marker (RAPD) profiles. Among them based on ARDRA, only five isolates WKh2104, WKh2501,
WKh5701, WKh2104 and Wu1401 showed different fingerprints when cut PCR product with \textit{Hpa}II and only isolate CCm1201 is different in DNA fingerprint with used A02 primer, 2 isolates WSk1101 and CB1101 are different in DNA fingerprint with used OPE1 primer and based on RAPD only 4 isolates WKh3104, CB1101, CB1201 and CKh9301 when used OPE3 primer. The result revealed small differences in DNA fingerprint although the straw mushroom in this study were different in morphology and fruiting body production. This study indicates that the straw mushroom isolates are very homogeneous genetic and unique DNA fingerprints for straw mushroom.