2Cp03 Study on diversity and potencies of Indonesian streptomycetes

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Studies on diversity and potencies of streptomycetes have been carried out and reported very frequently across the world. The importance of streptomycetes has been widely recognized due to their capacity to produce commercially significant pharmacologically active metabolites notably, antibiotics. However, studies on diversity and potencies of streptomycetes in Indonesia have not been known until the publication of *Streptomyces djakartensis* ATCC 13441^T Huber *et al.* 1962 which was found to be capable of producing a macrolide antibiotic, niddamycin. Since then, the report on Indonesian streptomycetes did not appear for quite long period before the publication of six novel species of the rhizosphre associated streptomycetes in 2000, namely *S. asiaticus* DSM 41761^T Sembiring *et al.* 2000, *S. cangkringensis* DSM 41769^T Sembiring *et al.* 2000, *S. indonesiensis* DSM 41759^T Sembiring *et al.* 2000, *S. javensis*DSM 41764^T Sembiring *et al.* 2000, *S. rhizosphaerius* DSM 41760^T Sembiring *et al.* 2000, and *S. yogyakartensis* DSM 41766^T Sembiring *et al.* 2000. Soon after then, the study on Indonesian streptomycete was continued extensively, ecpecially through "The Taxonomic and Ecological Studies of Fungi and Actinomycetes in Indonesia and Japan" which was started in 2003 and finished in 2006. As a result, the colaborative project published a novel species of *S. baliensis* ID03-0915^T Otoguro *et al.* 2009 along with several other Actinomycete novel species belong to the genus *Actinokineospora*, *Dietzia,* and *Kribella*. The range of exploration for streptomycetes has covered various natural habitats, suchs as soil, rhizosphere of various plants, including mangroove, living leaves, litters, dungs, insects, fresh water, as well as marine water. In terms of potencies of the streptomycetes which have been explored so far, including, capacity to produce antibiotics, such as antibacteria and anti fungi, enzymes suchs cellulase and chitinase, as well as capacity to accumulate heavy metals such as mercury. Therefore, it can be concluded that the study of diversity and potencies of the indigenous streptomycete strains has only recently been increasing significantly due to the extensive exploration by researchers through the inernational collaborative programme.

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2Cp04 Screening and characterization of rare actinomycetes isolated from Thai rhizospheric soil

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About eighty percent of the antibiotics originated from actinomycetes which are a large group of filamentous, gram-positive bacteria. *Streptomyces* is the largest antibiotics producing-bacterium in this group. However, the chance of getting new metabolites is greatly reduced due to the fact that many terrestrial streptomycetes isolated from different environments produce the same compounds. Therefore, factors which contribute to the increased rate of finding new bioactive microbial metabolites is targeted to discover novel groups of microorganisms, especially the rare actinomycetes. In this study, rare actinomycete strains were isolated from rhizospheric soils of Jack fruit (*Artocarpus heterophyllus*) and Elephant ear (*Colocasia esculenta*) plants collected in Bangkok, Thailand. Several media such as starch casein agar (SCA), humic acid vitamin agar (HVA), water proline agar (WP), and humic acid-MOPS gellan gum agar (HMG) as well as different pretreatment methods using high temperature, and exposing with either SDS or phenol were exploited. About 291 strains were collected and based on *16S rRNA* gene analysis, strain 44EHW presents the low similarity (97.8%) with *Actinokineospora enzanensis* IFO 16517(T). Therefore, this isolate was chosen for further taxonomical studies. Chemotaxonomic data were analyzed and its cell-wall diamino acid was *meso*-diaminopimelic acid with type III (A1γ) cell-wall peptidoglycan. Galactose, glucose, ribose, mannose, rhamnose, and arabinose were present in the whole-cell sugar content. The major menaquinone and fatty acid were MK-9(H4) and iso-C16:0, respectively, whereas, mycolic acid was absent. DNA G+C content of this strain was 74 mol%. The above results supported the affiliation of this isolate to the genus *Actinokineospora*. The results of DNA-DNA hybridization with DNA from closely related type strains of *Actinokineospora* species revealed low relatedness value. Therefore, strain 44EHW is proposed as a novel species of the genus *Actinokineospora*. The strain also showed antibacterial (*Bacillus subtilis*KB211, *Micrococcus luteus* KB212 and *Xanthomonas campestris* pv. *oryzae* KB88) and antifungal (*Candida albicans* KF1) activities.

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