

## **The Isolation Rate of Culturable Actinomycetes from Malaysian Borneo Forests and Their Activity Against Mammalian GSK-3 $\beta$**

### **ABSTRAK**

More than ten types of forests can be found in Sabah, Malaysian Borneo. Studies comparing culturable actinomycetes potential in this region are relatively scarce. This study described a preliminary statistical comparison of culturable actinomycetes isolation rates and their biological activity against mammalian glycogen synthase kinase-3 (GSK-3 $\beta$ ). We isolated 1049 isolates using standard isolation media for actinomycetes (HVA, ISP4 and AIA) with distinctive morphologies from the main forest types in Sabah; primary, secondary, mangrove, and beach forests. Isolate prevalence analysis revealed that secondary forests had the highest soil-to-isolate ratio (1:11). Interestingly, Kruskal-Wallis analysis revealed no significant differences in the overall isolation rates of actinomycetes, including non-sporulating strains, between forest types (P-value=0.142). The crude extracts of these isolates were assayed against GSK-3 $\beta$ , and we identified 19 active isolates; nine from primary and nine from secondary forests (no significant mean difference (P-value=0.558), one from beach forests, and none from mangrove forests. Overall, despite the different sampling locations and soil types, the isolation rates of culturable actinomycetes in Sabah did not vary significantly. However, both primary and secondary forests yielded more actinomycetes isolates that were active against mammalian GSK-3 $\beta$  than mangrove and beach forests. Hence, secondary forests are an attractive alternative to primary forests for exploring bioactive compounds from culturable actinomycetes in Sabah.