

DNA barcoding using chloroplast matK and rbcL regions for the identification of bamboo species in Sabah

ABSTRACT

Bamboo species play pivotal roles in maintaining ecological diversity and driving socio-economic development in Sabah, Malaysia. However, due to overlapping traits among distinct bamboo species, identifying them based solely on morphological characteristics poses challenges. DNA barcoding emerges as a highly effective method, demonstrating potential accuracy in identifying diverse plant species across various taxa and ecosystems. In this study, we used the chloroplast matK and rbcL regions as barcode markers to identify 15 bamboo plants in Sabah. Both matK and rbcL exhibited a notable 100% accuracy at the genus level, indicating their reliability in capturing broader taxonomic categories during BLAST searches and genetic distance analysis. However, at the species level, the success rate was limited to 60%, revealing challenges in differentiating closely related bamboo species using the existing DNA barcodes. Our findings underscore the need for an advanced DNA barcode reference library with extensive species coverage for accurate species identification. This study not only unveiled crucial insights into bamboo diversity and taxonomy in Sabah but also contributes to ongoing bamboo resource conservation and supports sustainable resource management in the region.