

Total RNA extraction from the aromatic *phalaenopsis bellina*, endemic orchid in Sabah, Borneo

ABSTRACT

Phalaenopsis bellina is an attractive orchid due to its unique appearance and distinctive floral fragrance. Many past studies on this plant focused on the plant at the molecular level; however, this requires sufficient quantities of high-quality *P. bellina* RNA. RNA is more delicate to manipulate than DNA due to its structural instability and its vulnerability to various secondary metabolites, such as polyphenols and polysaccharides. Therefore, in this study, 4 RNA isolation methods, a modified phenol-chloroform method and 3 commercial kits (Vivantis, Novogene, and Analytik Jena) were used on the leaves and flowers of *P. bellina* for comparison. The yield and purity of the total RNA were determined using spectrophotometry. The results showed that the total RNA isolated using the modified phenol-chloroform method had the highest yield (1223.75 ± 68.51 ng/ μ L) and purity compared to the 3 commercial kits, with an OD_{260/280} value of 2.07 and an OD_{260/230} value of 2.26, respectively. In particular, the isolated RNA did not show any detectable genomic DNA contamination or other impurities. The RNA isolated using the phenol-chloroform method was also evaluated by electrophoresis, reverse transcription, and PCR. The results indicated that the phenol-chloroform method appears to be superior for total RNA extraction. Thus, this developed method is proven to be suitable for the RNA extraction of plants rich in polysaccharides and polyphenols and is amenable for future molecular studies on *P. bellina*.