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Comparative analysis and innovation of a simple and rapid method for high-quality RNA and DNA extraction of kiwifruit

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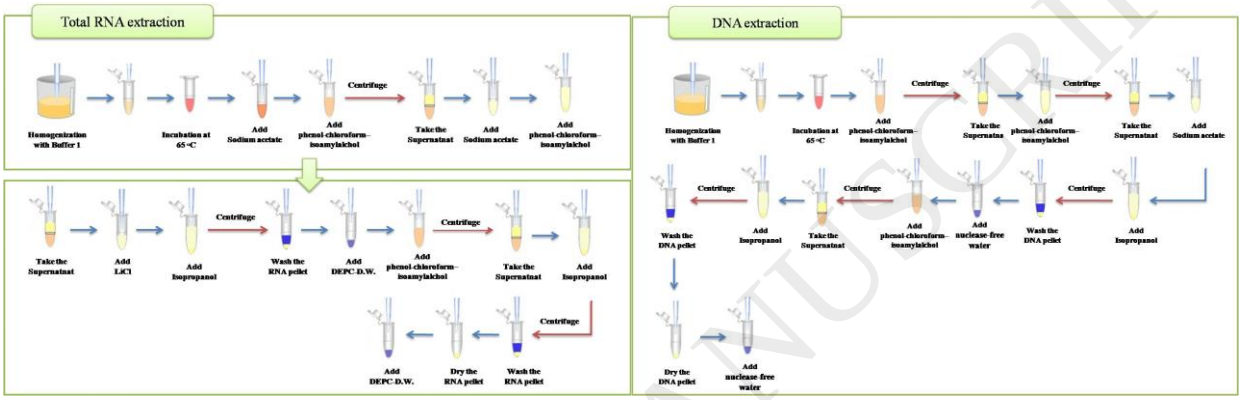
GRAPHICAL ABSTRACT



ABSTRACT

RNA and DNA extraction is a requirement for the study of gene expression and has an increasingly important role in genetic studies of all fleshy fruits. RNA and DNA extraction is difficult in kiwifruit due to the significant amount of polysaccharides and polyphenols compounds. So far, no commercial kit has been developed specifically for high-quality RNA and DNA extraction in kiwifruit and the common protocols for RNA extraction have poor yields. This study developed a new protocol for high quality RNA extraction in *Actinidia deliciosa*. According to the results, the average yield of RNA extraction of fruit and leaf of *A. deliciosa* was ~2180.7 ng/µl (~545.175 µg/g FW) and ~3424.9 ng/µl (~856.225 µg/g FW), respectively with A_{260}/A_{280} between 1.95 to 2.07 and A_{260}/A_{230} higher than 2 indicating high RNA purity. While the averages yield of RNA extraction using previous methods from kiwifruit and leaf was 23 µg/g FW and 527 µg/g FW, respectively. Also, the average yields of genomic DNA from kiwifruit ranged from 52 to 98 ng/µl with A_{260}/A_{230} between 0.60 to 1.64 and A_{260}/A_{280} between 1.40 to 1.48. To our knowledge, this is the first report of a highly efficient and rapid method of RNA and DNA extraction in kiwifruit which can be used for a broad spectrum of the all fleshy fruits.

ARTICLE INFO

Method name: RNA and DNA extraction for fleshy fruits
Keywords: RNA and DNA extraction, RT-qPCR, kiwifruit, polyphenols, polysaccharides

Method details

Preparation of material

Hayward kiwifruit samples from the cultivar of *A. deliciosa* with a mean soluble solid content of 6.1–6.95% and firmness of 80–100 N were collected from the research center gardens close to the city of Tonekabon at the north of Iran, at early November 2016. The samples for RNA extraction comprised outer pericarp (the green part, without seeds) were immediately frozen in liquid nitrogen and stored at -80ºC until the RNA was extracted.