

# Compatibility of DNA and RNA Extraction Methods for Challenging Plant Species

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## ABSTRACT

Frequent failure of downstream applications with DNA and RNA is often related to poor sample preparation. In particular, it is often difficult to extract DNA and RNA from samples that contain high levels of phenolic compounds, polysaccharides, volatile compounds and starch in an acceptable quality to be used in sensitive downstream applications such as PCR, RFLP and sequencing. Three different plant DNA and RNA isolation methods were validated to isolate genomic DNA and total RNA from challenging plant species, including raspberries, grapes, pears, pine needles and strawberry leaves. In the results, the relative yield of DNA and RNA, handling time and quality are systemically compared.

## DNA Isolation



Grape



Raspberry



Pine needle



Strawberry



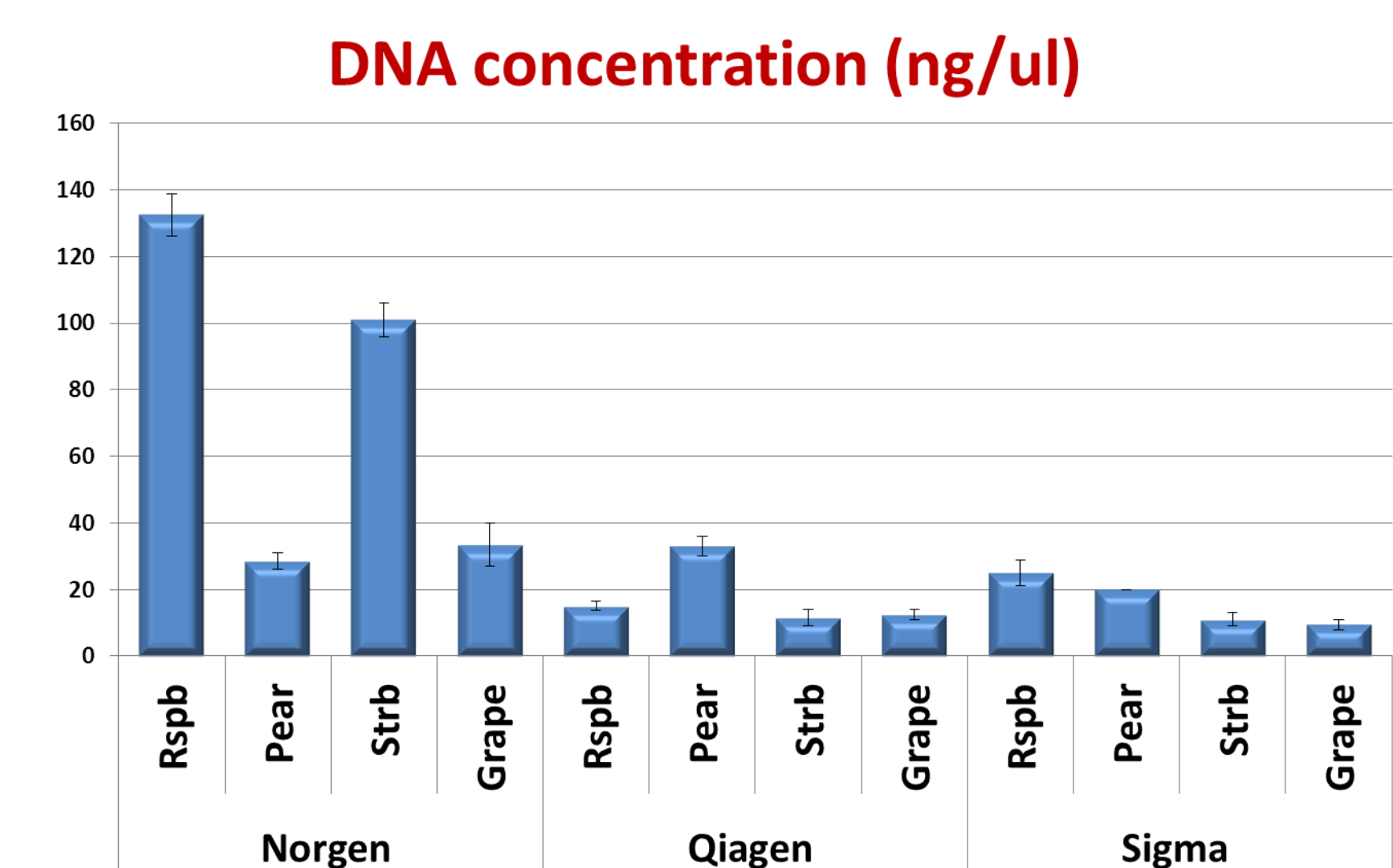
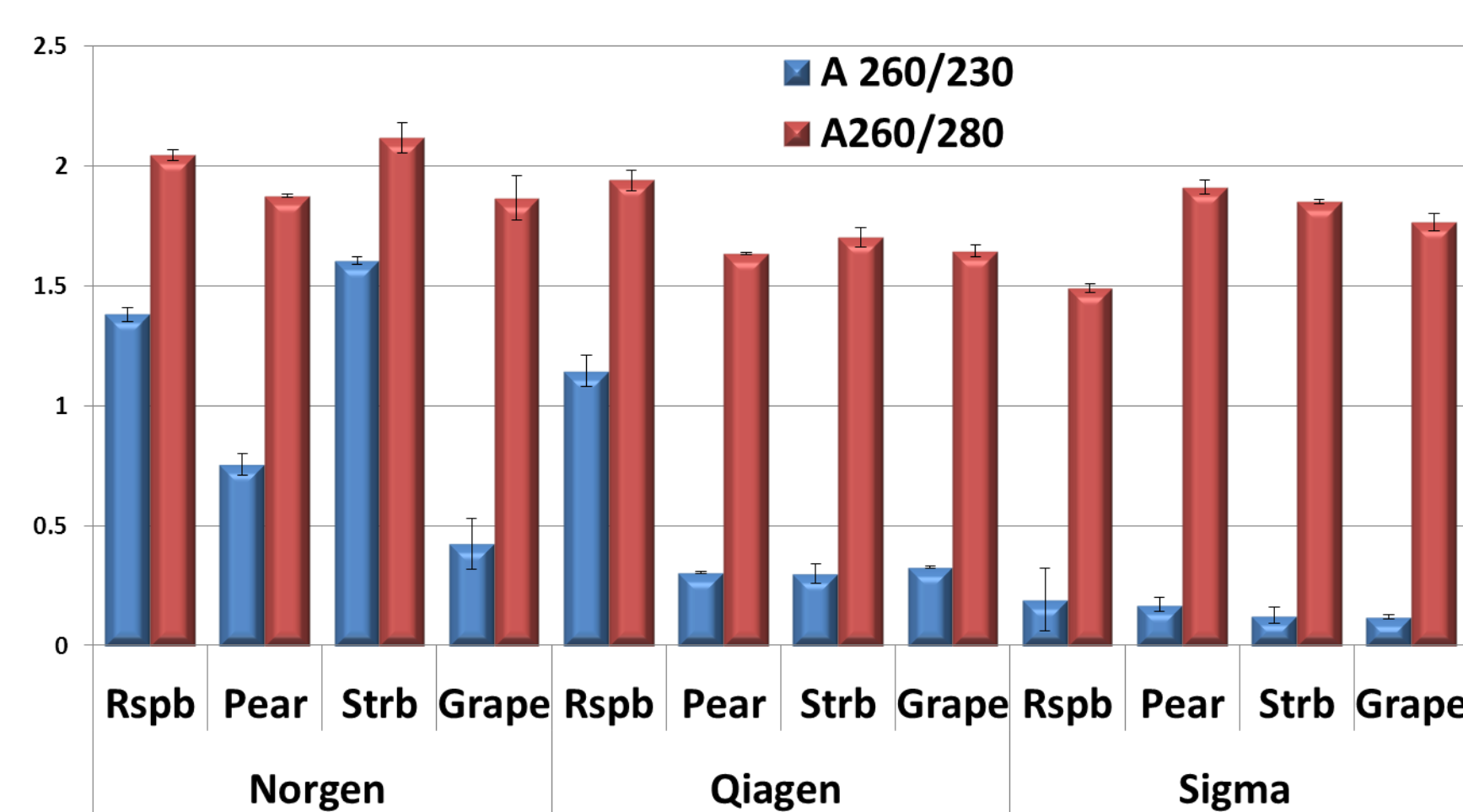
Pear

## RNA Isolation

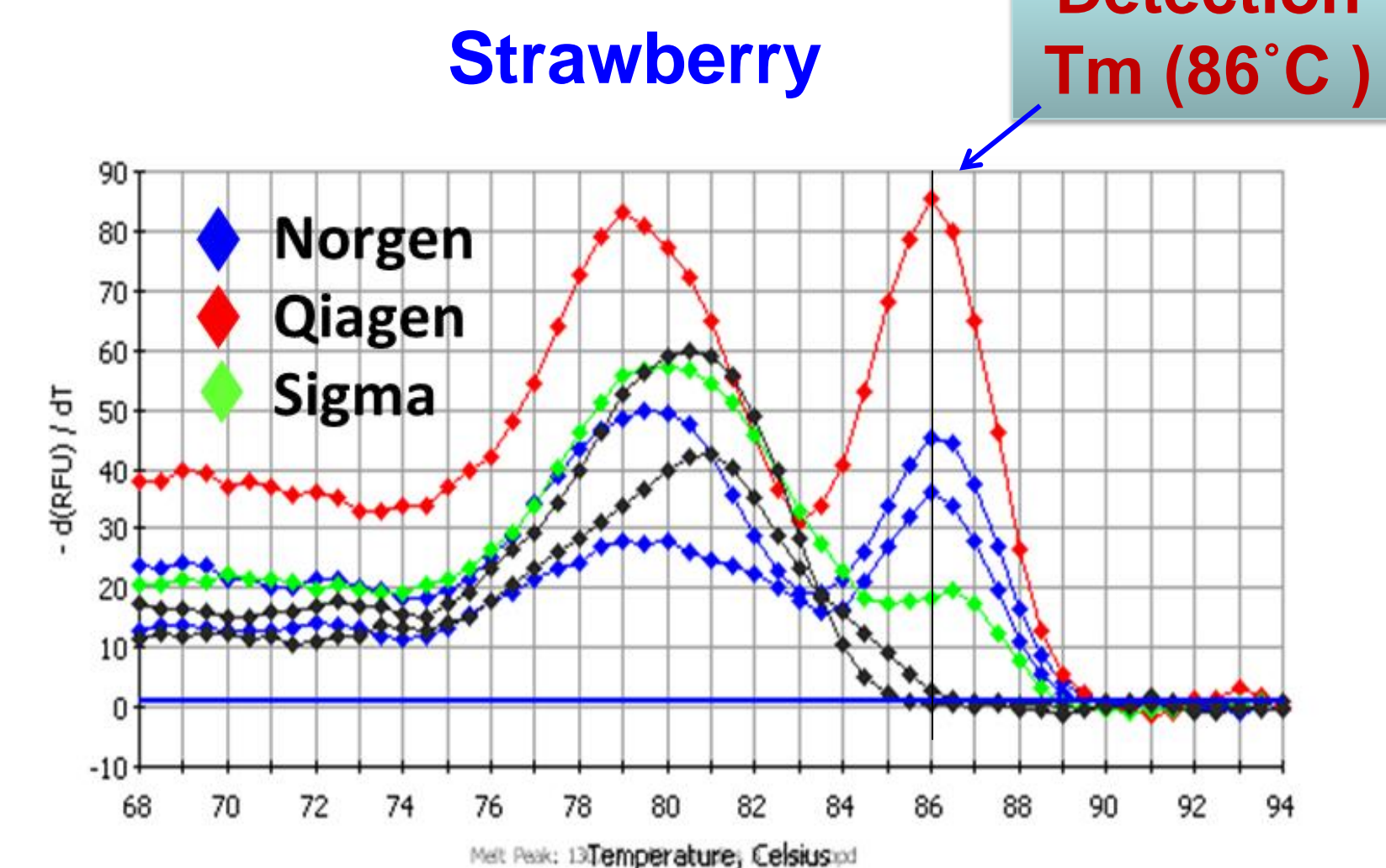
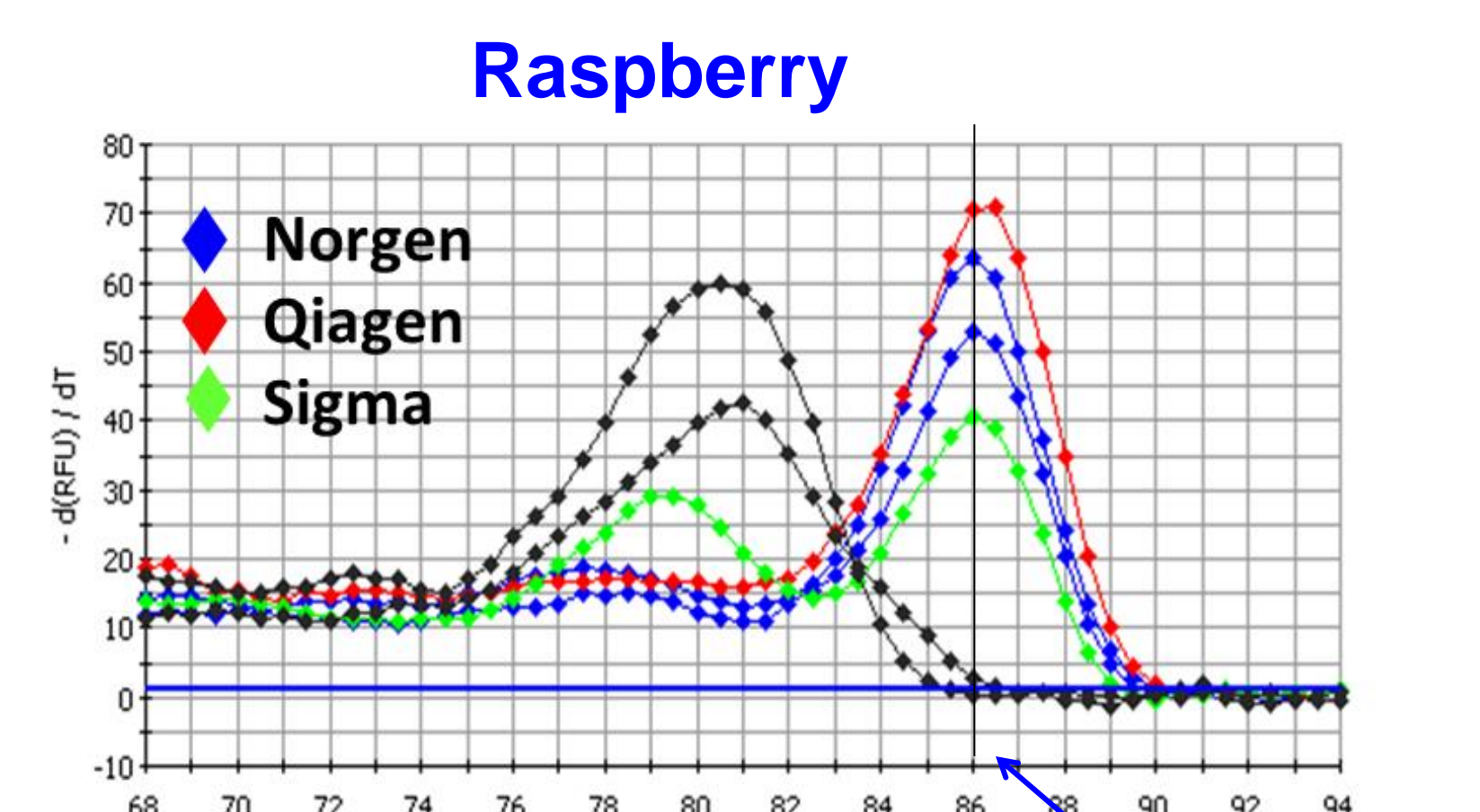
Company	Kit	Input volume	Filtering column	Column activation	Wash solutions	Elution	Handling time (Min.)
Norgen	Plant/Fungi DNA isolation	50 mg-100 mg	Yes	Not required	Wash solution I & II	100 ul	~30 min/ 10 samples
Qiagen	DNeasy Plant mini	100 mg	Yes	Not required	Wash solution AP3 and AW	100 ul	~ 30 min /10 samples
Sigma	GenElute Plant Genomic DNA miniprep	100 mg	Yes	Yes	Wash solution	Pre-warmed (at 65°C) 100 ul	~ 30 min /10 samples

Company	Norgen Biotek	Qiagen	Sigma
Kit	Plant/fungi total RNA purification kit	RNeasy Plant mini kit	miRNeasy
Resin	Silicon Carbide (SiC) column	Silica column	Silica column
Phenol	No	No	Yes
Processing Time	< 30 min. (10 samples)	< 30 min. (10 samples)	< 30 min. (10 samples)
			1 hour

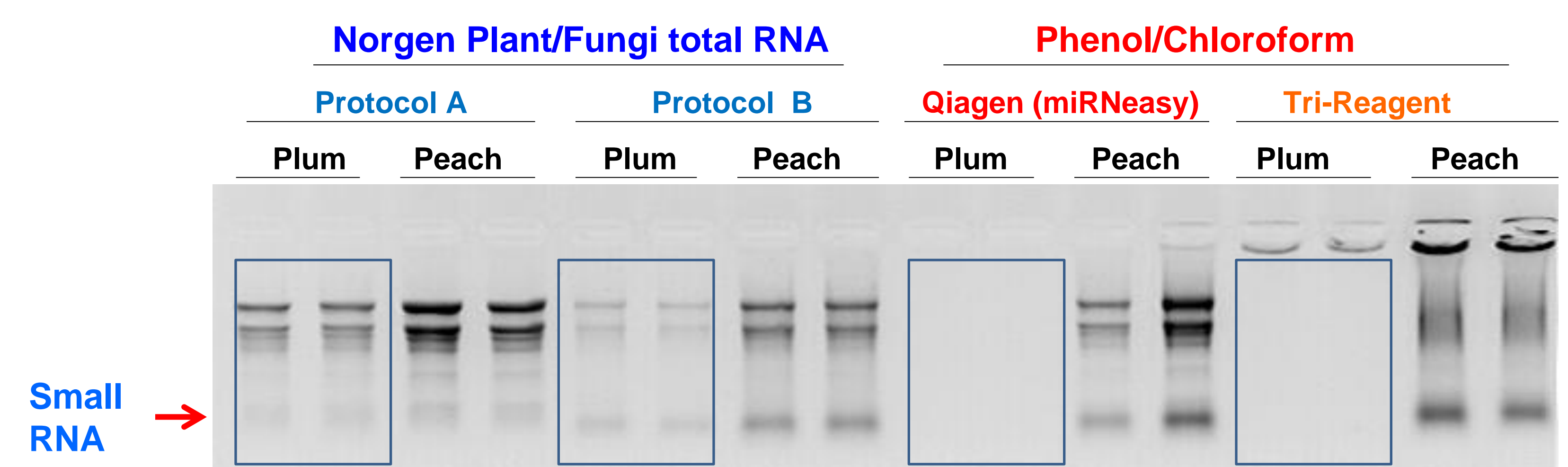
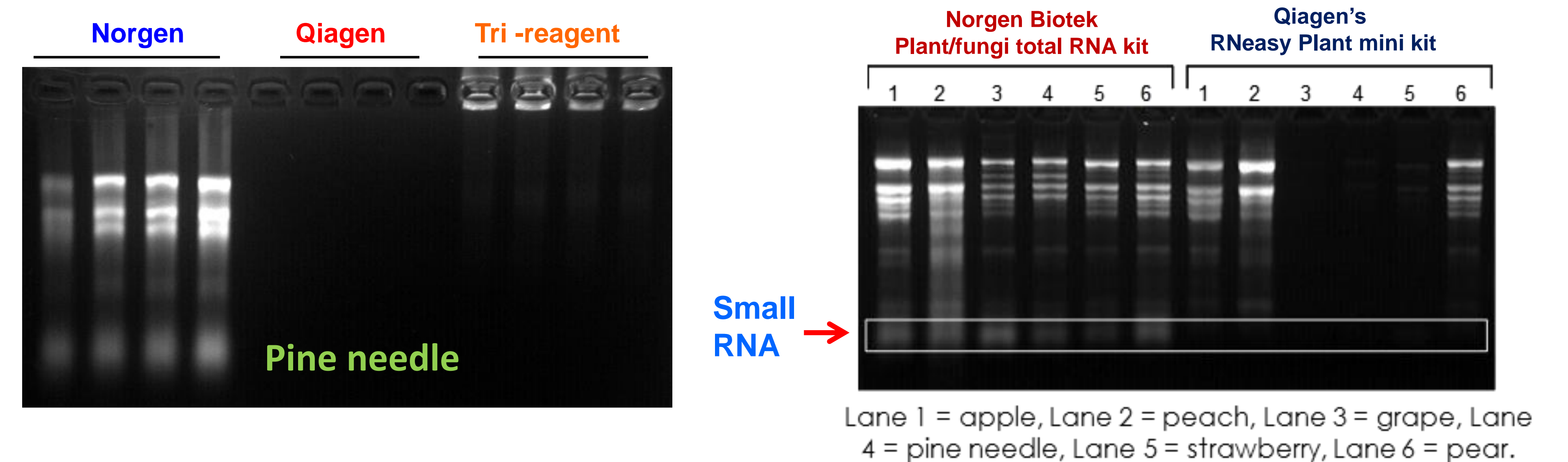
## Proven DNA quality and quantity



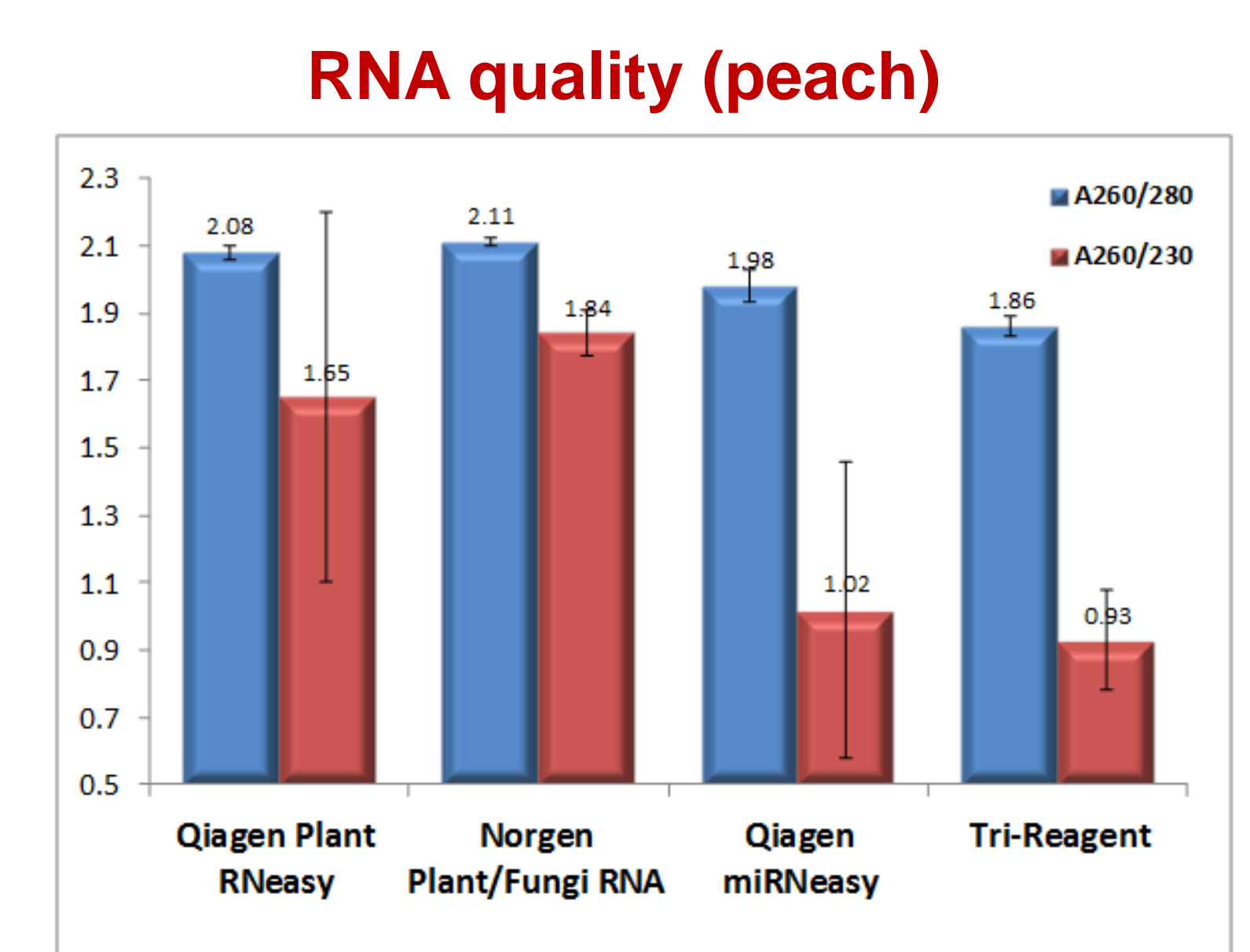
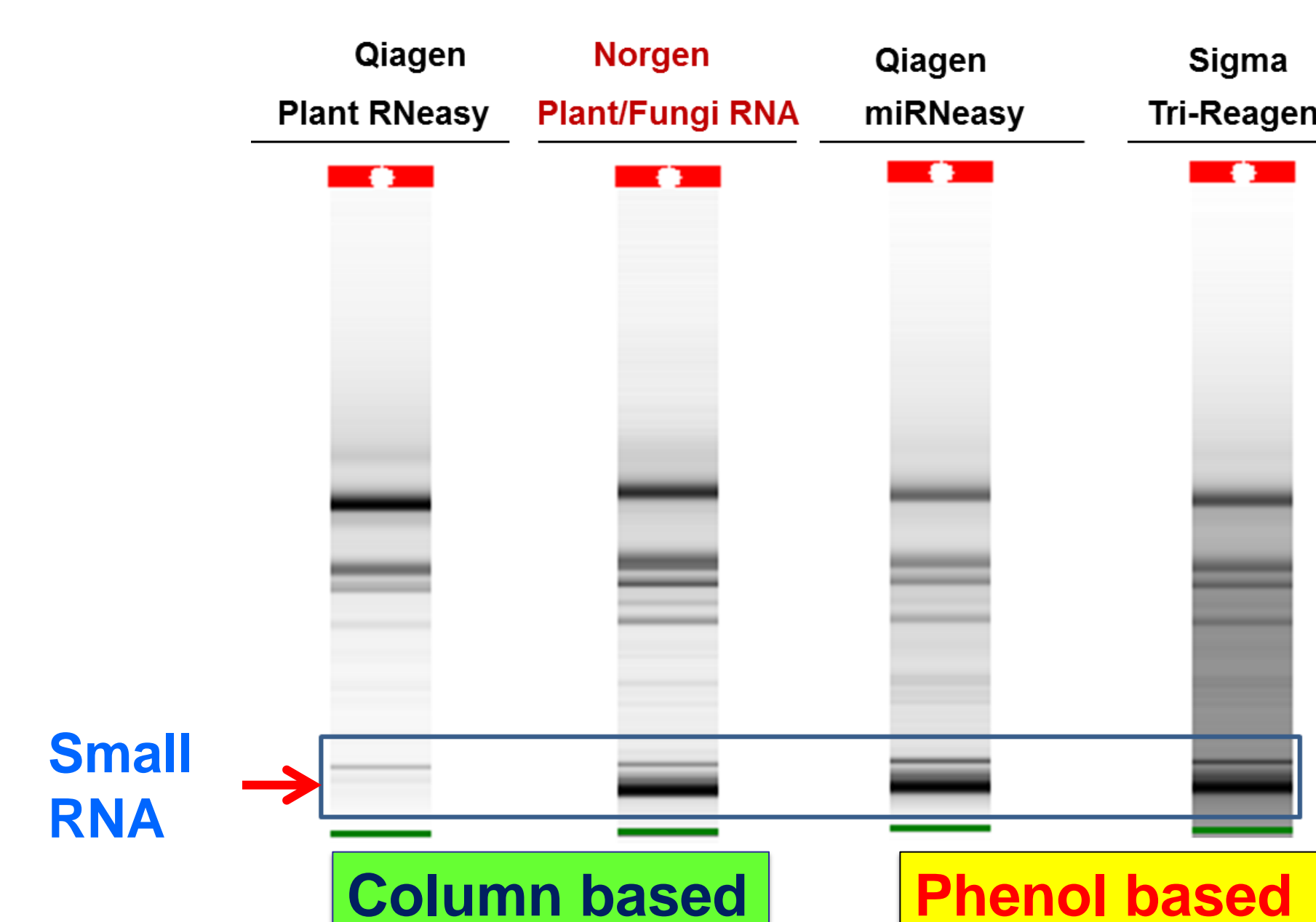
## 18S rDNA detection in a Real-time PCR (SYBR Green)



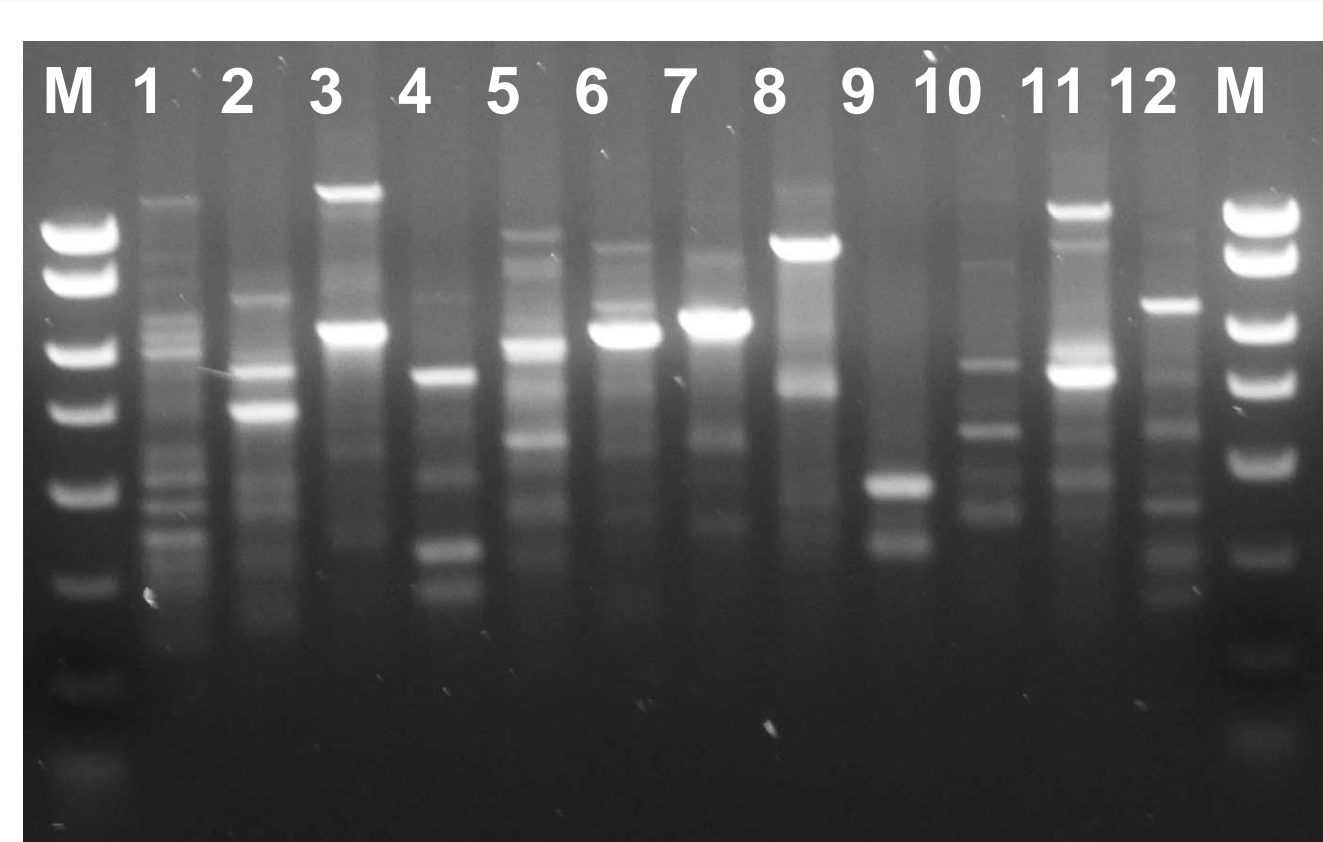
## True compatibility and total RNA profile from challenging plant species



## RNA Quality analysis using Bioanalyzer and spectrophotometer



## Application : Random Amplification of Polymorphic DNA(RAPD) analysis



- DNA was isolated from *Prosopis cineraria* using Norgen's Plant/Fungi DNA isolation kit.
- RAPD requires a high DNA quality to generate the band profile that discriminates amplification pattern for the species or subspecies grouping.
- 12 RAPD primers were successfully amplified the DNA fragments.