Plant Genomic DNA Extraction Kit

Cat #: orb782894 (manual)

For research use only. Not intended for diagnostic use.

Product Features

Specification	Storage/Shelf life
50T	Room temperature/1 year
200T	Room temperature/1 year

Assay Principle

This kit uses a unique buffer system and is especially suitable for extracting genomic DNA from fresh plant materials. It is safe, convenient, and easy to use. The kit effectively removes impurities, proteins, and other organic compounds from cells to the greatest extent possible. The extracted genomic DNA fragments are large, highly pure, stable, and reliable in quality. The recovered DNA can be used in a variety of routine applications, including enzyme digestion, PCR, library construction, Southern hybridization, and other downstream experiments.

Kit Components

Component	50T	200T	Storage
Buffer PGE	30 ml	120 ml	RT
Elution Buffer	10 ml	40 ml	
User Manual	1 copy	1 copy	

Notes:

1. If precipitation occurs, allow the solution in the kit to stand at room temperature for a period of time. If necessary, preheat it in a 56 °C water bath for 10 minutes to dissolve the precipitate.
2. Avoid repeated freezing and thawing of the sample, as this may result in smaller DNA fragments and reduced extraction yield.
3. Buffer PGE may turn yellow; this does not affect the extraction performance.
4. If precipitation occurs in Buffer PGE, dissolve it in a 37 °C water bath and mix well before use.
5. All centrifugation steps should be performed at room temperature using a benchtop centrifuge.
6. Chloroform must be prepared separately. A 25:24:1 phenol/chloroform/isoamyl alcohol solution may also be required.
7. Chloroform is toxic. Please wear appropriate protective clothing when handling it.

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Assay Protocol

Operation steps

The following procedure is designed for processing 100 mg of fresh green plant leaves or other tissues. If a larger amount of tissue is processed, the volumes of the corresponding solutions can be scaled up proportionally.

1. Sample preparation: Take 100 mg of fresh plant tissue or 20 mg of dry tissue and grind thoroughly with liquid nitrogen. Add 600 µl of Buffer PGE, 6 µl of RNase A (10 mg/ml; optional), and β-mercaptoethanol to a final concentration of 2 mM (optional). Vortex for 1 minute, then incubate in a 60 °C water bath for 20 minutes.

Note: Due to the diversity of plant materials, the optimal sample amount should be determined based on the specific material used. For young plant tissues, such as Arabidopsis thaliana, the tissue can be disrupted directly using a pipette tip. For older or tougher tissues, grinding with liquid nitrogen is recommended.

2. Add 700 µl of chloroform, mix thoroughly, and centrifuge at 12,000 rpm (~13,400 × g) for 10 minutes.

Note: For plant tissues rich in polyphenols or starch, an equal-volume extraction may be performed in Step 2 using phenol/chloroform/isoamyl alcohol at a ratio of 25:24:1.

3. Carefully transfer the upper aqueous phase from the previous step to a new centrifuge tube. Add an equal volume of isopropanol, mix well, and centrifuge at 12,000 rpm (~13,400 × g) for 10 minutes. Discard the supernatant.

4. Add 75% ethanol to the pellet, mix by inversion, and centrifuge at 12,000 rpm (~13,400 × g) for 10 minutes. Discard the wash solution and repeat this step once.

Note: During this step, the pellet may easily detach from the tube wall in ethanol. Remove the supernatant carefully to avoid disturbing the pellet, as this may reduce recovery.

5. Carefully remove the remaining ethanol using a 10 µl pipette tip, then allow any residual ethanol to evaporate in a clean bench.

6. Add 50–200 µl of Elution Buffer to fully dissolve the DNA product.

DNA concentration and purity Detection

The size of the genomic DNA fragments obtained is related to factors such as sample storage time and shear force during handling. The concentration and purity of the recovered DNA can be assessed by agarose gel electrophoresis and UV spectrophotometry. DNA should show a clear absorption peak at OD260, with an OD260 value of 1 corresponding to approximately 50 µg/ml double-stranded DNA or 40 µg/ml single-stranded DNA. The OD260/OD280 ratio should be between 1.7 and 1.9. If deionized water is used for elution instead of Elution Buffer, the ratio may be lower because pH and ionic strength can affect absorbance values; however, this does not necessarily indicate low purity.

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Declaration

1. Avoid repeated freezing and thawing of the sample, as this may result in smaller DNA fragments and reduced extraction yield.
2. If precipitate is present in Buffer PGE, re-dissolve it in a 56 °C water bath and mix well before use.
3. All centrifugation steps should be performed at room temperature using a benchtop centrifuge.
4. This kit is intended for laboratory research use only.

Troubleshooting

Cituation	Possible reason	Recommendations
No genome was proposed or genome concentration was low.	Low genomic DNA extraction yield	Some plant tissues contain low amounts of genomic DNA, so a low DNA concentration may be normal. If a larger amount of DNA is required for downstream applications, the extraction can be repeated multiple times and the DNA can be concentrated.
	Selection of dissolution volume and time	The dissolution volume will affect the final yield. A larger dissolution volume may increase the total yield, but it will reduce the DNA concentration. Use the recommended dissolution volume provided in the kit to achieve the best balance between yield and concentration. After adding Elution Buffer, incubating the sample at room temperature for 2–5 minutes will help improve DNA dissolution.

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