Magnetic Plant DNA Kit

Cat.No.: HYC253

Product Description

This kit delivers a simple and high-efficiency protocol for plant DNA extraction. After physical disruption of plant cells, DNA contained in lysates binds to the surface of silica-coated magnetic beads under high-salt conditions. Following washing steps, purified DNA is eluted in Buffer TB or deionized water. The DNA yield is highly dependent on sample type and the efficiency of cell lysis. Purified DNA is compatible with downstream applications including next-generation sequencing and PCR detection.

Components

Components	96 T
Buffer PLS	60 mL
Buffer ZB	55 mL
Buffer GW1*	80 mL
Buffer TB	10 mL
RNase A (10 mg/mL)	0.6 mL
Magnetic Microspheres N	2×1 mL

Storage

All components can be stably stored in a dry place at room temperature (15-30℃).

Required Reagents and Equipment

- Absolute Ethanol

Instructions

Preparations

1. Before the first experiment, add the specified volume of anhydrous ethanol to Buffer GW1 following the instructions printed on the reagent bottle label.
2. Prepare self-supplied 75% ethanol for washing procedures.

3. Magnetic Microspheres N must not be frozen or processed with high-speed centrifugation, as these operations may cause irreversible damage to Magnetic Microspheres N.

Plant Tissue Disruption

Protocol 1

1. Weigh approximately 50–100 mg fresh plant powder fully ground with liquid nitrogen, or 30 mg dried plant powder. Transfer rapidly into a centrifuge tube pre-loaded with 400–600 µL Buffer PLS and 5 µL RNase A (10 mg/mL). Mix by quick inversion, spin briefly, then incubate on a thermomixer at 70 °C with shaking at 1600 rpm for 10 min.
   Note: For plants rich in polysaccharides and polyphenols, add β-mercaptoethanol to Buffer PLS to a final concentration of 5% to improve nucleic acid recovery.

Protocol 2

1. Load 50–100 mg fresh plant material or 20 mg dried plant material into a 2.0 mL centrifuge tube.
2. Snap-freeze material with liquid nitrogen, then grind thoroughly into fine powder using a tissue pestle.
3. Add 400–600 µL Buffer PLS and 5 µL RNase A (10 mg/mL) to the tube. Mix rapidly by inversion, then incubate on a thermomixer at 70 °C with shaking at 1600 rpm for 10 min.
   Note: For plants rich in polysaccharides and polyphenols, add β-mercaptoethanol to Buffer PLS to a final concentration of 5% to improve nucleic acid recovery.

Protocol 3

1. Add 50–100 mg fresh plant material or 20 mg dried plant material to a 2.0 mL centrifuge tube.
2. Supplement the tube with 400–600 µL Buffer PLS, 5 µL RNase A (10 mg/mL) and one steel bead. Immediately fix the tube on a tissue homogenizer for vigorous disruption.
3. Retrieve the tube from the homogenizer and spin briefly. Incubate on a thermomixer at 70 °C with shaking at 1600 rpm for 10 min.
   Note: For plants rich in polysaccharides and polyphenols, add β-mercaptoethanol to Buffer PLS to a final concentration of 5% to improve nucleic acid recovery.

Follow-Up DNA Purification Procedures (Post Plant Tissue Disruption)

1. After centrifugation at 12,000 rpm (~13,400×g) for 4 min, transfer all supernatant to a new 1.5 mL centrifuge tube. Add 550 µL Buffer ZB and 20 µL Magnetic Microspheres N into the tube, mix by repeated inversion for 30 s and spin briefly.
2. Incubate at room temperature for 5 min with several inversions during the period. Spin briefly, place the tube on a magnetic rack for 1 min (★ until the solution turns clear), then discard supernatant without touching magnetic beads.
3. Remove the tube from the magnetic rack, add 650 µL Buffer GW1, vortex for 10 s to fully resuspend beads. Shake on a thermomixer at 25 °C, 1600 rpm for 2 min, or vortex continuously for 1 min.
4. Mount the tube on the magnetic rack and stand for 1 min, then thoroughly discard supernatant.
5. Repeat Steps 3–4 once.
6. Take the tube off the magnetic rack, add 650 µL self-prepared 75% ethanol, vortex for 10 s to resuspend beads. Shake on a thermomixer at 25 °C, 1600 rpm for 2 min, or vortex for 1 min.
7. Place the tube on the magnetic rack for 1 min and fully discard supernatant.
8. Repeat Steps 6–7 once.
9. Spin the tube briefly, pipette out residual liquid at the tube bottom, then air-dry at room temperature for 5–10 min to fully evaporate ethanol.
10. Add 100 µL Buffer TB to the tube and vortex to completely suspend beads in elution buffer. Incubate on a thermomixer at 65 °C with shaking at 1600 rpm for 10 min, or place in a 65 °C water bath for 10 min with vortex mixing 4 times during incubation.
11. Fix the tube on the magnetic rack for 2 min until all beads adhere to the tube wall. Transfer the supernatant containing purified DNA to a new centrifuge tube for subsequent use; store at −20 °C long-term.