VAMNE Magnetic Universal Plant Total DNA Kit (Prepackaged)

DMA4103

Vazyme

Instruction for Use

Version 25.1

Vazyme

Contents

For Research Use Only. Not for use in diagnostic procedures.

01/Product Description

VAMNE Magnetic Universal Plant Total DNA Kit (Prepackaged) is designed for extracting DNA from various plant tissues, achieving high-throughput sample processing. The kit is based on superparamagnetic particle purification technology and a unique reagent system, which can specifically adsorb nucleic acids and remove various impurities through wash buffers. The RNase A provided with the kit effectively removes RNA, and the DNA is finally eluted in Elution Buffer. The fully automated procedure is simple, rapid, and safe. The obtained DNA is ready-to-use for downstream molecular biology experiments such as PCR, KASP, restriction enzyme digestion, hybridization, and high-throughput sequencing.

02/Components

Components	DMA4103-01 (1 × 96 T)
Binding (Plate 1)	1
Beads (Plate 2)	1
Wash 1 (Plate 3)	1
Wash 2 (Plate 4)	1
Wash 3 (Plate 5)	1
Elution (Plate 6)	1
Lysis Buffer PLA	80 ml
Proteinase K	2.5 ml
RNase A (100 mg/ml)	50 µl

03/Storage

Store at 15 ~ 25°C and ship at room temperature.
Proteinase K and RNase A can be stored at room temperature for up to 18 months.

04/Applications

Plant leaves and fungi: 20 - 100 mg; Polysaccharide-rich tubers and roots: 20 - 50 mg; Seeds: 10 - 30 mg; Fruits: 50 - 200 mg.

05/Applicable Instruments

For use with the full-automatic nucleic acids extraction instrument (Vazyme #VNP-96P) and equivalent instruments.

06/Notes

1. The automated nucleic acid extraction instruments should be disinfected with the UV light for 30 min before and after use.
2. Traces of magnetic beads may remain in the eluate after extraction. Avoid aspirating the magnetic beads. If magnetic beads are accidentally aspirated, repeat magnetic absorption once more using a magnetic rack.
3. Properly dispose of all samples and reagents. Thoroughly wipe down and disinfect all work surfaces with 75% ethanol.
4. Before use, if there is any precipitate in the Lysis Buffer PLA, incubate at 42°C until fully dissolved.

07/Experiment Process

07-1/Reagents Preparation

Take out the prepackaged plates from the kit. Invert the Beads Plate (Plate 2) several times to fully resuspend the magnetic beads. Gently flick the plates to concentrate the reagents and beads at the bottom of the well. Before use, ensure the 96 deep-well plate orientation and carefully remove the aluminum sealing film.

▲ Avoid vibration when tearing off the sealing foil to prevent liquid from spilling.

07-2/(Optional) Aliquoting RNase A

Dilute the RNase A working solution (100 mg/ml) to 4 mg/ml with ddH_2O. Add 40 μg (10 μl) of the diluted RNase A to Wash 2 Plate (Plate 4) for each well.

▲ Make sure the RNase A working solution is added directly to the liquid in the well. Adding it onto the wall will reduce the efficiency of RNA removal.

▲ The diluted RNase A should be prepared freshly and used immediately.

▲ If RNA residues have no effect on downstream, this step can be omitted.

07-3/Sample Pretreatment

1. Sample grinding: Rapidly transfer fresh or frozen (-85 ~ -65°C) plant tissue into a liquid nitrogen–precooled mortar and grind thoroughly. Continuously add liquid nitrogen to maintain the tissue at a low temperature until it is ground into a fine powder with no obvious particles. Alternatively, grind the tissue into a fine powder at low temperature using a fully automated tissue homogenizer. Detailed parameters are provided in the table below.

Sample type	Homogenizer parameters
Plant leaves, flowers, fruits, fungi, etc	40 - 60 Hz 45 sec 1 cycle
Plant polysaccharide-rich tubers, roots, etc	40 - 60 Hz 45 sec 2 cycles
Plant seeds such as soybeans, corn seeds, etc	60 Hz 45 sec 3 cycles

▲ The grinding parameters can be adjusted depending on the difficulty of disrupting the sample. Laboratory-standard grinding parameters may also be used as appropriate.

▲ If higher nucleic acid integrity is required, the grinding frequency can be reduced to 45 Hz, and the number of grinding cycles can be adjusted accordingly.

▲ The grinding module should be pre-cooled with liquid nitrogen before grinding. For repeated grinding, the module should be re-cooled with liquid nitrogen between each grinding interval.

2. Take an appropriate amount of ground plant tissue, then immediately add 800 µl Lysis Buffer PLA and 20 µl Proteinase K (For multi-sample extraction,a master mix of Lysis Buffer PLA and Proteinase K can be prepared with this ratio). Vigorously vortex for 60 sec until the mixture is homogeneous and no visible tissue clumps remain. Centrifuge at 12,000 rpm (~13,400 × g) for 5 min at room temperature, then transfer 700 µl of supernatant to the Binding Plate (Plate 1).

▲ For general plant leaf and fungal samples, an input of approximately 50 mg is recommended. For polysaccharide-rich tuber, root, and seed samples, an input of approximately 20 mg is recommended. For seed samples such as wheat and rice, if the input amount exceeds 30 mg, Seed Lysis Buffer (Vazyme #DMA4101-C2) is recommended and available upon request from sales representatives. For fruit samples, an input amount of approximately 100 mg is recommended. For samples with low DNA content, input amount can be appropriately increased. Due to the wide diversity of plant samples, the input amount can be adjusted based on specific experimental requirements and prior experience.

▲ For certain seed or polysaccharide-rich samples, a transparent gel-like layer may appear between the precipitate and the supernatant after centrifugation. Accidentally aspirating this layer can affect extraction efficiency. To ensure optimal results, the volume of the supernatant can be appropriately reduced.

07-4/Operation on the automatic instrument

1. Place the 96 deep-well plates into the full-automatic nucleic acid extraction instrument in the following order: Binding (Plate 1), Beads (Plate 2), Wash 1 (Plate 3), Wash 2 (Plate 4), Wash 3 (Plate 5) and Elution (Plate 6). Position the plates with the notched corner toward the inner right front of the instrument. Place the magnetic rod sleeve into the Beads Plate (Plate 2) and ensure it is properly seated.

2. Edit the program as below or select the corresponding pre-imported program to perform automated extraction.

Step	Plate Position	Name	Mixing Time (min)	Adsorption Time (sec)	Waiting Time (min)	Volume (µl)	Mixing Speed	Temperature (°C)	Mixing Position	Mixing Amplitude	Adsorption Position	Adsorption Speed
1	2	Beads	0.1	0	0	700	8	-	7	80	0	10
2	1	Lysis	5	0	0	1,000	8	58	7	80	0	10
3	2	Beads	0.5	30	0	700	8	-	7	80	0	10
4	1	Lysis	2	60	0	1,000	8	58	7	80	0	10
5	3	Wash 1	1	30	0	700	8	-	7	80	0	10
6	4	Wash 2	1	30	0	700	8	-	7	80	0	10
7	5	Wash 3	1	30	5	700	8	-	7	80	0	10
8	6	Elution	3.5	60	0	70	8	75	7	80	0	10
9	2	Beads	0.1	0	0	700	8	-	7	80	0	10
Other settings (in the Option menu): Temperature control (TC) setting (TC Type: Start with TC); **Adsorption setting (Adsorption type: three-stage adsorption)**; Drying setting (Drying position: Above the kit; Drying fan: OFF)												

3. For seed or polysaccharide-rich samples, the following procedure is recommended to achieve optimal extraction efficiency.

Step	Plate Position	Name	Mixing Time (min)	Adsorption Time (sec)	Waiting Time (min)	Volume (µl)	Mixing Speed	Temperature (°C)	Mixing Position	Mixing Amplitude	Adsorption Position	Adsorption Speed
1	2	Beads	0.1	0	0	700	8	-	10	80	0	10
2	1	Lysis	5	0	0	1,000	8	58	10	80	0	10
3	2	Beads	0.5	30	0	700	8	-	10	80	0	10
4	1	Lysis	2	60	0	1,000	8	58	10	80	0	10
5	3	Wash 1	1	30	0	700	8	-	10	80	0	10
6	4	Wash 2	1	30	0	700	8	-	10	80	0	10
7	5	Wash 3	1	30	5	700	8	-	10	80	0	10
8	6	Elution	2.5	60	0	70	8	75	10	80	0	10
9	2	Beads	0.1	0	0	700	8	-	10	80	0	10
Other settings (in the Option menu): Temperature control (TC) setting (TC Type: Start with TC); **Adsorption setting (Adsorption type: three-stage adsorption)**; Drying setting (Drying position: Above the kit; Drying fan: OFF)												

4. After the automated extraction, promptly transfer the eluates from Elution Plate (Plate 6) (note the valid wells) into clean centrifuge tubes.The extracted product can be stored at -85 ~ -65°C for long-term storage, and -30 ~ -15°C for short-term storage.

▲ For DNA quantification using NanoDrop, ddH_2O can be used for calibration.

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