Soil Genomic DNA Kit

Cat. No.: S1522826 | Pack size: 50T | Storage: Room temperature

Overview

This kit uses a unique humus removal buffer system to maximally eliminate interfering impurities such as humic acid from soil samples. It is also equipped with homogenization tubes containing grinding beads that effectively disrupt various complex components in soil samples, ensuring the integrity of genomic DNA extracted from soil. The purified DNA can be directly used in downstream applications such as next-generation sequencing (16S amplicon and metagenomics), library construction, PCR, qPCR, Southern blot, restriction enzyme digestion, and molecular markers.

Product Components

Product No.	Component	Appearance	50T	Storage
S1522826A	Buffer MS1	Liquid	40 mL	RT
S1522826B	Buffer MS2	Liquid	4 mL	RT
S1522826C	Buffer MS3	Liquid	14 mL	RT
S1522826D	Buffer MS4	Liquid	11 mL	RT
S1522826E	Buffer MS5	Liquid	66 mL	RT
S1522826F	Buffer PWS1	Liquid	17 mL	RT
S1522826G	Buffer EB	Liquid	15 mL	RT
S1522826H	Homogenization Tube A	-	1 EA × 50	RT
S1522826I	PBF Spin Column (with 2 mL collection tube)	-	1 EA × 50	RT

The kit can be stored under dry conditions at room temperature for 15 months.

Precautions

Freshly collected samples yield higher recovery. Before sampling different soil types, consult the appropriate optimal storage conditions to avoid sample deterioration that may affect extraction results.

When pipetting supernatants, avoid sucking up any precipitate, as this may introduce impurities and affect product purity.

Excess DNA may inhibit downstream PCR reactions. If this occurs, it is recommended to dilute the DNA template before use.

Before use, check Buffer MS2 for precipitation. If present, heat at 37 ℃ until completely dissolved before use.

The user needs to supply absolute ethanol (for pretreatment of Buffer PWS1) and 70% ethanol.

Procedure

Before use, add 22 mL of absolute ethanol to Buffer PWS1.

1. Add 250 mg of soil sample to Homogenization Tube A, ensuring the sample is evenly distributed at the bottom of the tube.

2. Add 750 µL of Buffer MS1 to the tube. Vortex for 15 sec to thoroughly mix the soil sample with the buffer and initially disperse the sample.

3. Add 60 µL of Buffer MS2. Place the tube on a thermomixer at 37 ℃ and 1500 rpm, and shake for 10 min to allow the humus removal buffer to effectively remove humic acid from the soil.

Note: *Before use, check Buffer MS2 for precipitation. If present, heat at 37 ℃ until completely dissolved before use.*

4. Centrifuge at 12,000 rpm (13,400 × g) for 1 min to fully pellet impurities. Carefully transfer the supernatant to a new 2 mL centrifuge tube.

5. Add 250 µL of Buffer MS3 to the tube, mix thoroughly, vortex for 5 sec, and place at 4 ℃ for 5 min.

6. Centrifuge at 12,000 rpm (13,400 × g) for 1 min. Transfer the supernatant to a new 2 mL centrifuge tube, add 200 µL of Buffer MS4, mix thoroughly, and place at 4 ℃ for 5 min.

7. Centrifuge at 12,000 rpm (13,400 × g) for 1 min to fully pellet impurities. Transfer the supernatant to a new 2 mL centrifuge tube, add 1200 µL of Buffer MS5, and mix by inversion.

Note: *Do not transfer any precipitate when removing the supernatant, as this may introduce impurities and reduce DNA purity.*

8. Transfer the solution from step 7 into a PBF spin column (placed in the provided 2 mL collection tube). Centrifuge at 12,000 rpm (13,400 × g) for 30 sec. Discard the flow-through and return the spin

column to the collection tube. Add no more than 700 µL per transfer; if the volume exceeds, transfer in multiple portions until all liquid has been loaded.

9. Add 700 µL of Buffer PWS1 (with ethanol pre-added) to the spin column. Centrifuge at 12,000 rpm (13,400 × g) for 30 sec. Discard the flow-through and return the spin column to the collection tube.

10. Add 700 µL of 70% ethanol (user-supplied) to the spin column. Centrifuge at 12,000 rpm (13,400 × g) for 30 sec. Discard the flow-through and return the spin column to the collection tube to further remove residual salts and impurities.

11. Centrifuge the spin column together with the collection tube at 12,000 rpm (13,400 × g) for 2 min to completely remove residual wash buffer and impurities (this avoids residual ethanol affecting subsequent DNA elution and experiments).

12. DNA elution

Transfer the spin column to a new 1.5 mL centrifuge tube. Open the cap and let stand at room temperature for 2 min to allow residual ethanol to evaporate completely. Slowly add 50-100 µL of Buffer EB dropwise to the center of the membrane without touching it. Let stand at room temperature for 1 min. Centrifuge at 12,000 rpm (13,400 × g) for 30 sec. Collect the DNA solution in the centrifuge tube.

Notes:

(1) The volume of Buffer EB should not be less than 50 µL, as too small a volume will reduce DNA recovery efficiency. If water is used for elution, ensure its pH is between 7.0 and 8.5 (adjust with NaOH). Store the DNA solution at -20 ℃ to prevent degradation.

(2) Reloading the eluate from step 12 onto the spin column, letting it stand at room temperature for 2 min, and centrifuging at 12,000 rpm for 30 sec can increase the final DNA concentration.

DNA Concentration and Purity Assessment

The fragment size of the extracted genomic DNA is influenced by factors such as sample storage time and shear forces during handling. The purified DNA can be assessed for concentration and purity by agarose gel electrophoresis and UV spectrophotometry.

1. Concentration determination

Measure the absorbance of the sample at 260 nm (A260) using a UV spectrophotometer to determine DNA concentration. If dilution is required, Buffer EB is recommended. Dilution with water may lead to inaccurate readings. The absorbance at 260 nm should be kept within 0.1-1.0 to ensure accuracy. Conversion: 1 unit of absorbance at 260 nm corresponds to 50 µg/mL of double-stranded DNA or 40 µg/mL of single-stranded DNA.

2. Purity assessment

Evaluate DNA purity by the A260/A280 ratio. For high-quality genomic DNA, the A260/A280 ratio should be between 1.7 and 1.9. If ddH_2O instead of Buffer EB is used for elution, the ratio may be lower due to the influence of pH and ions on light absorption; this does not necessarily indicate low DNA purity.

Storage & Shipping

Parameter	Specification
Storage Conditions	Room temperature
Shipped In	Normal
Stability And Storage	Store at room temperature long term (15 months).

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