

Optimized extraction protocols for high-yield and high-quality genomic DNA isolation from dried corn kernels using the AllEx® Mini Plant DNA Kit

Experimental Conditions

Materials



AllEx® Mini Automated Nucleic Acid Extraction System
[AEX012]

This image will be updated soon

AllEx® Mini Plant DNA Kit
[979-048]

Sample & Extraction Information

Origin	Teosinte
Sample	 Dried corn kernel (<i>Zea mays</i> L.)
Target	Genomic DNA
Sample amount	250 mg
Elution volume	100 µl
Extraction protocol	Customized extraction protocol for corn - Customized protocol 1 (CP 1) - Customized protocol 2 (CP 2) - Customized protocol 3 (CP 3)
Operating time	- CP 1: 24' 00" - CP 2: 24' 00" - CP 3: 29' 00"

Protocol

AllEx® Mini Plant DNA Kit Protocol

* For more details and methods, please refer to [the manual of AllEx® Mini Plant DNA Kit](#).

Sample Preparation

1. Grind the samples into a fine powder using a blender (or equivalent grinding machine) as thoroughly as possible.
2. Weight out 250 mg of the sample and put it in a 2 ml microcentrifuge tube.
3. Add 1 ml of Buffer SQ1 and vortex vigorously for 2 min.
4. After briefly spinning down the sample, incubate for 20 min at room temperature.
5. Vortex vigorously for 2 min and centrifuge at 13,000 rpm for 10 min at room temperature.
6. Carefully transfer 300 µl of the supernatant to the 1st well of the cartridge, avoiding the fat and debris layer.
7. Add 10 µl of RNase A Solution (20 mg/ml) to the 3rd well of the cartridge.

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Results

Dried corn kernel (<i>Zea mays</i> L.)	Mean (n=3)		
	CP1 (CV)	CP2 (CV)	CP3 (CV)
Yield (µg)	12.1 (0.30)	15.2 (0.20)	17.7 (0.16)
A_{260}/A_{280}	1.98 (0.08)	2.09 (0.00)	2.07 (0.00)
A_{260}/A_{230}	1.73 (0.37)	2.16 (0.04)	2.11 (0.05)

Table 1. Evaluation of DNA yield and purity from dried corn kernels

Genomic DNA was extracted from dried corn kernels (n=3) using the AllEx® Mini Plant DNA Kit and the AllEx® Mini Automated Nucleic Acid Extraction System with three different extraction protocols (CP1, CP2, and CP3). The yield and purity of the extracted DNA were assessed with a NanoDrop™ 2000 spectrophotometer.

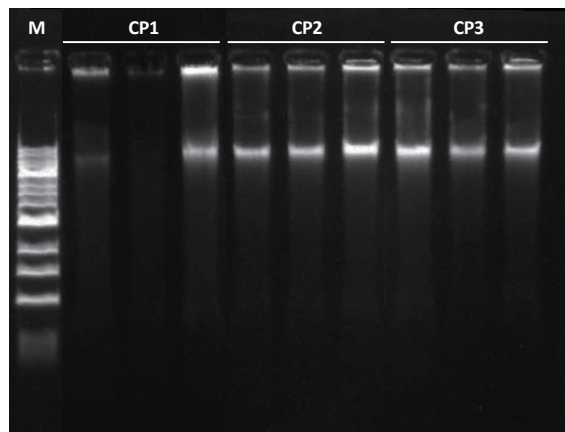


Figure 1. Agarose gel electrophoresis results of extracted genomic DNA from dried corn kernels
Extracted genomic DNA samples were subjected to electrophoresis on a 1% agarose gel in 0.5X TBE buffer at 100 V for 30 min. DNA fragment sizes were confirmed using the GENESTA™ 1 kb DNA Ladder (GA-100), and the electrophoresis results were analyzed with the SmartView Pro 1100 Imager System (UVCI-1100).

Conclusion

- Among the tested protocols, CP3 proved to be the most effective for gDNA extraction from dried corn kernels.
- The efficiency of nucleic acid extraction improves when the sample and buffer are thoroughly mixed; therefore, sufficient vortexing or mixing is recommended during the incubation and lysis steps.
- During incubation, the sample mixture tends to clump upon heat exposure, which negatively affects extraction efficiency. Thus, it is recommended that nucleic acids from dried corn kernels be extracted under non-heated conditions.

Ordering Information

Cat. No.	Product	Size
AEX012	AllEx® Mini Automated Nucleic Acid Extraction System	1 Unit
979-048	AllEx® Mini Plant DNA Kit	48 T