Clean Quick Plant

DNA extraction

Genomic DNA extraction from plant leaves or seeds

Flexible DNA extraction for your plant workflow

Plant research plays a crucial role in addressing global challenges in agriculture and climate change. By studying plant DNA, scientists can develop more resilient and stronger crops that can withstand diseases, drought and heat. DNA-based screening allows plant breeders to identify desirable traits more efficiently, accelerating the breeding of improved plant varieties. A key step in plant DNA research is DNA extraction. To support this, we offer our flexible and robust Clean Quick Plant magnetic bead solution.

Clean Quick Plant is a versatile one component product for the extraction of DNA from plant seeds and leaves. It delivers a high-quality DNA binding agent, while offering the user the flexibility to combine it with specific binding or washing buffers of their choice. The reagent is suitable for both manual workflows as well as automated platforms such as our CleanXtract 96, making plant DNA extraction faster and more efficient.

Benefits:

- **Suitable for NGS/PCR**
- **Easy automation**
- **Wide variety of sample types**
- **Fast and efficient**

Application

Plant DNA research has revolutionized agriculture, environmental science, and biotechnology. Downstream applications in these fields include Next-Generation Sequencing (WGS, RNA-Seq), (q)PCR, SNP genotyping and CRISPR/Cas9 gene editing.

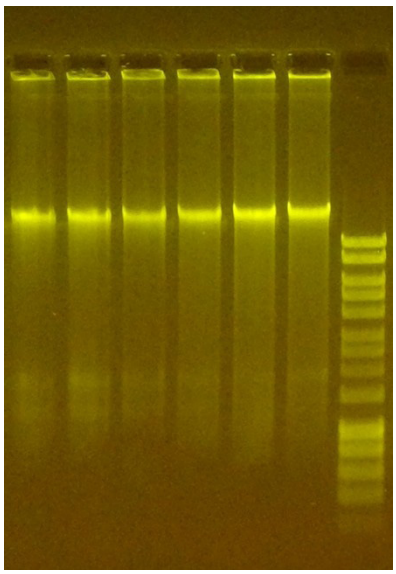
Proof of Principle

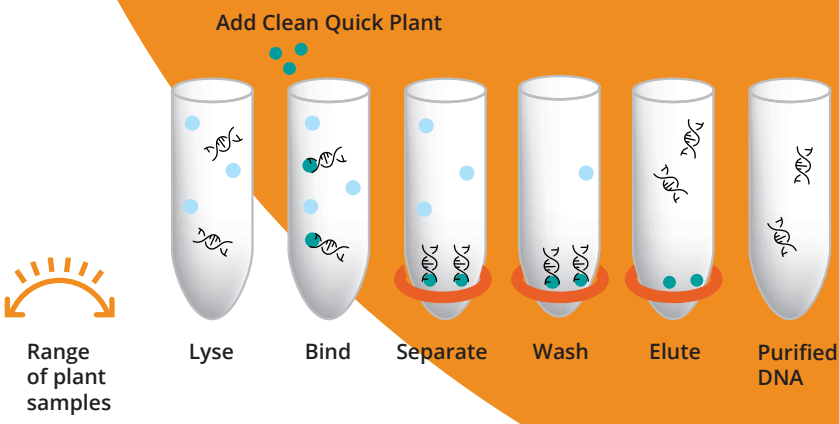
DNA Integrity

To check the integrity of extracted DNA, Clean Quick Plant DNA extraction was performed on 300 µL supernatant of grinded and lysed sunflower and wheat plant seeds.The size distribution of the extracted DNA visualized on an agarose gel indicates high DNA integrity.

FIGURE 1.

Agarose gel electrophoresis analysis of genomic DNA extracted from different crop seeds (10 µL sample per slot). Lanes 1-3 contain DNA from sunflower seeds and lanes 4-6 contain DNA from wheat seeds. Lane 7 contains a 1kb ladder.





Workflow

Disrupted plant samples are first lysed with a lysis buffer of choice (user-determined). Add Clean Quick Plant to the lysed plant material and the plant DNA will bind to the surface of the magnetic particles. The magnetic particles are separated from the lysate by a magnetic separation device. After the required ethanol wash steps, the purified DNA is eluted.

DNA Purity

In addition to the agarose gel analysis, OD measurements were performed to show the purity of the DNA extracted from sunflower and wheat seeds. The 260/230 ratio greater than 2.0 and 260/280 ratio greater than 1.8 indicate that the extracted DNA is free of protein, polyphenols or other contaminants, making it suitable for all downstream applications indicated (Table 1).

TABLE 1.
OD measurements of eluted DNA showing DNA yield and purity from sunflower and wheat seeds.

n=10	ng/µL ± SD	260/230 ± SD	260/280 ± SD
Sunflower	133 ± 8	2,18 ± 0,05	2,10 ± 0,03
Wheat	94 ± 7	2,28 ± 0,04	2,04 ± 0,03

In another experiment, DNA was extracted from tomato and cucumber leaves. After grinding, lysing and centrifuging, 100 µL of supernatant was used for extraction with Clean Quick Plant. Similar to the OD values of the DNA extracted from plant seeds, the 260/230 ratio greater than 2.0 and 260/280 ratio greater than 1.8 indicating that the DNA extracted from leaves is free of contaminants and suitable for all downstream applications indicated (Table 2).

TABLE 2.
OD measurements of eluted DNA comparing DNA yield and purity from tomato and cucumber leaves.

n=10	ng/µL ± SD	260/230 ± SD	260/280 ± SD
Tomato	37 ± 3	2,14 ± 0,05	2,02 ± 0,06
Cucumber	50 ± 3	2,38 ± 0,04	2,02 ± 0,03

qPCR

To confirm that the Clean Quick Plant reagent is compatible with downstream applications like qPCR, a Clean Quick Plant DNA extraction from maize seeds was performed including an Extraction Control DNA (Meridian Bioscience). DNA extraction from 72 samples yielded an average of 365.85 ng/uL with 260/230 ratio of 2.06 and 260/280 of 2.03. qPCR of the internal DNA control was performed in duplicate, and exhibited an average Ct value of 30.62 ± 0.23 which was in the expected range for the control DNA used (29 ± 1.6) - indicating high reproducibility. This result confirms that there is no inhibition of the polymerase reaction due to polyphenols or other plant chemicals and that the amplification steps after extraction were successful utilizing Clean Quick Plant.

TABLE 3.
qPCR results of qPCR Extraction Control Red DNA (Meridian Bioscience) after a Clean Quick Plant extraction procedure, performed by 3 different operators.

	All operators
Average Ct value	30,62
Standard deviation	0,23
Total number of samples	72

About CleanNA

CleanNA is a Dutch manufacturer of magnetic bead-based nucleic acid extraction kits. We produce our reagents according to our EN-ISO 13485 certified quality management system and our kits are easy to automate on general liquid handling systems. CleanNA's product portfolio includes kits for extraction from a range of sample types, both for research and diagnostic procedures.

Ready to order?

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Order info

Product	Part number
Clean Quick Plant - 50 mL	CQP-D0050
Clean Quick Plant - 500 mL	CQP-D0500

Product	Part number
Clean Magnet Plate 96-well RN50	CMAG-96-RN50
CleanXtract 96	CXT-I096

Clean Quick Plant is distributed by:

ISO 13485 BUREAU VERITAS Certification

Our quality management system is certified to EN-ISO 13485 by Bureau Veritas

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