OxMag Plant DNA/RNA Purification Kit

High-Throughput Technology

Qualitative Assay for Automatic Extraction Systems

INSTRUCTION FOR USE

Version 1. MAG-004.02.21

Research Use Only

MAG-004

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Description of the kit

Intended use

The OxMag Plant DNA/RNA Purification Kit is designed for the efficient isolation of DNA and RNA from plant complex matrices such as young fresh leaves, seeds, roots, stems, buds, flowers, and fruits. The technology allows high-throughput analyses, requires low handling, gives an advantage in simplicity and speed, reduces the risk of contamination. The analytical performance and sensitivity of the kit were thoroughly tested in laboratory settings.

The kit components

- The kit composition is described in "**Table 1. The buffers and components of the kit.**"
- Instructions for Use (IFU) – detailed guidelines for high-quality DNA and RNA Purification methodology which could be easily adapted to the various automated systems and samples.
- Material Safety Data Sheet (MSDS) – the documents contain information about hazard identification, first aid measures, firefighting, accidental release measures, handling and storage, exposure control, and personal protection.

Table 1. The buffers and components of the kit

OxMag Pathogen DNA/RNA Purification Kit		200 rxn	500 rxn	2,000 rxn	Transportation and Storage
Solution A	Pre-Lysis Buffer	205 ml	505 ml	1010 ml x 2	Room temperature
Solution B	Lysis Buffer	105 ml	255 ml	1010 ml	Room temperature
Solution C	Binding Buffer	60 ml	71 ml x 2	570 ml	Room temperature
Solution W1 (conc.)	Wash Buffer 1	17 ml	42 ml	170 ml	Room temperature
Solution W2 (conc.)	Wash Buffer 2	17 ml x 3	70 ml x 2	140 ml x 4	Room temperature
Solution E	Elution Buffer	50 ml	105 ml	105 ml x 4	Room temperature
OxMag® Beads* *Magnetite*	Synthetic Magnetic Beads	4 ml	10 ml	40 ml	Room temperature

* - Do not freeze OxMag® Beads solution. Store at 2-8 ºC

Reagents Preparation

Solution W1

Wash Buffer 1 comes as a concentrate. Prior to initial use, combine the recommended quantity of ethanol, which must be at least 95% pure, as specified in "Table 2. Preparation of Solution Wash 1."

Table 2. Preparation of Solution Wash 1

No. Reactions	Solution W1	Ethanol ≥95%	Final Volume
200	17 ml	88 ml	105 ml x 1 bottle
500	42 ml	213 ml	255 ml x 1 bottle
2000	170 ml	830 ml	1000 ml x 1 bottle

Solution W2

Wash Buffer 2 comes as a concentrate. Prior to initial use, combine the recommended quantity of ethanol, which must be at least 95% pure, as specified in "Table 3. Preparation of Solution Wash 2"

Table 3. Preparation of Solution Wash 2

No. Reactions	Solution W2	Ethanol ≥95%	Final Volume
200	17 ml x 3	90 ml (In each bottle)	107 ml x 3 bottles
500	70 ml x 2	350 ml (In each bottle)	420 ml x 2 bottles
2000	140 ml x 4	680 ml (In each bottle)	820 ml x 4 bottles

Lysis/Binding Bead Mix (For Routine Testing)

Prepare Solution C with ethanol ≥95% and magnetic beads for routine testing. Add the appropriate volume of components indicated in "Table 4. Preparation of Solution C with Magnetic Beads **and Ethanol**" for same-day use.

Table 4. Preparation of Solution C with Magnetic Beads and Ethanol

No. Reactions	Solution C	Ethanol ≥ 95%	OxMag® Beads	Final Volume
200	60 ml	21 ml	4 ml	85 ml
500	71 ml x 2	25 ml (In each bottle)	5 ml (In each bottle)	101 ml
2000	570 ml	200 ml	40 ml	810 ml

Recommended Sample Pretreatment

Plant complex matrices

50 mg of solid plant material (fresh leaves, seeds, roots, stems, buds, flowers, and fruits) requires homogenization with liquid nitrogen to be powdered and mixed with Solution A. The same amount of fresh leaves, buds, and pulp may be transferred directly into the buffer and homogenized with bead beating machine. The procedure should be performed on ice. If this is not possible, then freeze the sample immediately after homogenization.

The List of Materials to be Supplied by the User

Table 5. Equipment and Reagents to be Supplied by the User

Equipment	Consumables
Thermoblock or thermomixer	Ethanol ≥95%
Centrifuge	Nuclease-free Water
Mortal and a pestle	Liquid Nitrogen
Bead beating machine, vortex	RNase-free 1.5 ml microcentrifuge tubes
Pipette 0.5 - 10 µl	Benchtop cooler or ice box
Pipette 10 - 100 µl	0.5 - 10 µl pipette tips with filter
Pipette 100 - 1000 µl	20 – 200 µl pipette tips with filter
Magnetic rack	100 - 1000 µl pipette tips with filter
Tecan, King Fisher Flex or other liquid handlers	Automation platform-compatible plastics

Instructions for Automated Purifications

Sample Pretreatment

Before starting the procedure, prepare the solutions and enzymes according to the solution preparation guide (Table 2-3). **Do not freeze OxMag® Beads solution.** Store at 2-8ºC. Before pipetting, ensure that the OxMag® Beads solution is homogeneous to have an even distribution of nanoparticles (use a vortex or HulaMixer). Solution A, Solution B and Solution C may form precipitates upon storage. Warm them up to 60°C until the residues have fully dissolved.

We recommend using 10-50 mg of fresh or 10-20 mg of dried plant samples.

1. Add liquid nitrogen to a mortar and freeze the plant by placing it in the liquid nitrogen within the mortar. Grind the tissue thoroughly using a clean pestle. Add 1000 µl of Solution A and homogenize. The procedure should be performed on ice. If this is not possible, then freeze the sample immediately after homogenization.

Alternatively, plant tissue can be placed in a homogenization tube with 900 µl of Solution A, which can be homogenized using OxBeads zirconia or OxBeads steel in Bead Beating machine for 2-5 min.

2. Transfer the lysate into a 1.5 ml microfuge tube and freeze the sample for 15 min at -20˚C.

3. Warm up to room temperature (RT) and centrifuge at 8,000 rpm for 1 min. Discard the supernatant without disturbing the pellet.

4. Dissolve the pellet in 500 µl of Solution B by pipetting.

5. Incubate the sample for 15 min at 56˚C in a thermomixer at 1,400 rpm. Alternatively, incubate in a thermo-block and vortex periodically at 5 min intervals.

6. Freeze the sample for 10 min at -20˚C.

7. Warm up to room temperature (RT), centrifuge at 13,000 rpm for 10 min at 4˚C.

8. Transfer 400 µl of supernatant into a new microfuge tube (for manual purification) or into an automation platform-compatible sample plate (for automated purification).

9. Prepare Binding Bead Mix. For one reaction, add 100 µl ethanol ≥95% to 280 µl Solution C (Binding buffer). Vortex briefly and add 20 µl of OxMag® Beads. For routing testing, use Table 4.

Automated Purification

1. Set up the instrument (800 µl sample input volume).

2. Prepare the processing plates:

- Plate wash (plate position 2): Add 500 µl of Solution W1 to each well in the plate;
- Plate wash (plate position 3): Add 800 µl of Solution W2 to each well in the plate;
- Plate wash (plate position 4): Add 800 µl of Solution W2 to each well in the plate;
- Plate elution (plate position 5): Add 50-200 µl of Solution E to each well in the plate.

3. Prepare sample plate. Ensure the lysed samples are added to the plate wells according to the sample pretreatment protocol step 8. Add 400 µl of Nuclease-free Water to the Negative Control well. Invert Binding Bead Mix gently to have a homogeneous mixture, then add 400 µl to each well.

4. Load the prepared plates into the appliance according to the relevant appliance instructions.

Disposal

Dispose of used kit reagents, human clinical samples, and sealed amplification plates as laboratory clinical waste according to local, state, and federal regulations.

Version History

Instruction for Use, Version 3. MAG-004. EN. Feb 2021

Quality Control System

The Kit is in accordance with 2017/746-EN Medical Device Regulations.

Technical support

For technical support, please contact our dedicated Technical Support Team at:

TEL: +995 599 374 374, Email: info@oxgen.ge

Trademarks and Disclaimers

OxMag is a trademark of OxGEn, LLC. AM 2021 11324.

References

Vladimer Baramidze, Luca Sella, Tamar Japaridze (2025), A Barcoded ITS Primer-Based Nanopore Sequencing Protocol for Detection of Alternaria Species and Other Fungal Pathogens in Diverse Plant Hosts. J. Fungi 2025, 11(4), 249; https://doi.org/10.3390/jof11040249

Vladimer Baramidze, Luca Sella, Tamar Japaridze (2024), Long amplicon Nanopore sequencing of Botrytis cinerea and other fungal species present in infected grapevine leaf samples. Biology Methods and Protocols, Volume 9, Issue 1, 2024, bpad042, https://doi.org/10.1093/biomethods/bpad042

Explanation of Symbols

	Attention
	Lot Number
	Catalogue Number
	Production Date
	Refer to the Operating Instructions
	Shelf life
	If the Package Is Damaged “Do Not Use It”
	Manufacturer Information
	EC Representative
	Temperature limit