

	Environmental Analysis Teaching and Research Laboratory	Date: X/XX/XXXX	Number: 24
	Standard Operating Procedure	Title: Genomic DNA Extraction from Plants (Algae)	
	Approved By: TBD	Revision Date: August 9, 2016	

1. DNA Extraction

1.1 The scope of this SOP is train researchers to become familiar with the steps and procedures involved in extracting genomic DNA from plant material, and in particular, algal species. With the use of equipment and materials provided in the Nucleospin Plant II Kit, DNA from plant samples can be successfully extracted by following proper protocol, safety precautions, and by paying close attention to the detailed instructions outlined in this handout, alongside the Professor.

1.2 The applications of this SOP are for various types of plant samples. As long as samples can be homogenized, this procedure for DNA extraction is applicable.

2. Summary of Method

2.1 Plant samples are homogenized by mechanical treatment or collected in a manner that does not require additional treatment (i.e. samples suspended in water/solvent). The DNA is then extracted with Lysis Buffers PL1 or PL2 containing chaotropic salts, denaturing agents, and detergents, which are used to break open cells and cell membrane structures so the DNA can be isolated. RNase A is included to remove RNA and allow photometric quantification of pure genomic DNA. Crude lysates from the samples are cleared by centrifugation and/or filtration using the Nucleospin Filters to remove polysaccharides, contaminants, and residual cellular debris. The clear flow-through that passes through filtration is mixed with binding buffer PC to create conditions for optimal binding of DNA to the silica membrane. After loading this mixture into the spin column, contaminants (proteins, RNA, metabolites, other PCR inhibitors) are washed away using Wash Buffers PW1 and PW2. The genomic DNA is finally eluted with low salt Elution Buffer PE or nuclease-free water to wash away unbound proteins.

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3. Acknowledgements

4. Definitions

4.1 Term1: is...

5. Interferences

5.1 Biases and interferences can come from...

6. Health and Safety

6.1 Describe the risk...

Safety and Personnel Protective Equipment

7. Personnel & Training Responsibilities

7.1 Researchers training is required before this the procedures in this method can be used...

7.2 Researchers using this SOP should be trained for the following SOPs:

- SOP01 Laboratory Safety
- SOP02 Field Safety

8. Required Materials

8.1 DNA, RNA, and protein purification: Nucleospin Plant II Kit Red. 740770.50

8.2

- Reagents: 96-100 percent Ethanol
- Consumables: 1.5mL microcentrifuge tubes, disposable tips
- Equipment: micropipettes (ranging from 2-200microliters), centrifuge with rotor capable of reaching 4500g, thermal heating block or water bath for incubation and elution, mortar and pestle (if necessary for homogenization), and personal protection equipment

9. Estimated Time

9.1 This procedure requires XX minutes...

10. Procedure

10.1 Prepare ...

10.2

11. References

11.1 APHA, AWWA. WEF. (2012) Standard Methods for examination of water and wastewater. 22nd American Public Health Association (Eds.). Washington. 1360 pp. (2014).