



TABLE OF CONTENTS

RESEARCH TITLE	i
APPROVAL SHEET	ii
STATEMENT OF ORIGINAL CONTRIBUTION	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF APPENDICES	xii
ABSTRACT	xiii
I. INTRODUCTION	1
1.1. Background	1
1.2. Issues	2
1.3. Objectives	3
1.4. Benefit	3
II. LITERATURE REVIEWS, THEORETICAL JUSTIFICATION & HYPOTHESES	4
2.1. Shallot (<i>Allium cepa</i> L. var. <i>aggregatum</i>)	4
2.2. Nitrogen	6
2.3. Nitrate Transporter Gene (NRT2.1)	7
2.4. Chlorate	8
2.5. Cloning Gene	10
2.6. TAIL PCR	11
2.7. Theoretical Justification	12
2.8. Hypotheses	14
III. MATERIALS AND METHODS	15
3.1. Research Location	15
3.2. Research Equipments	15
3.3. Materials	16
3.4. Methods	18



3.4.1. Chlorate Toxicity Treatment.....	18
3.4.2. Molecular Identification.....	19
3.4.2.1. Cultivation 15 cultivars and extraction total DNA of shallot.....	19
3.4.2.2. Cultivation and extraction total RNA of shallot seeds (Tuk-tuk).....	21
3.4.2.3. Analysis of RNA concentration root and leaf shallot samples	22
3.4.2.4. Reverse transcriptase PCR	22
3.4.2.5. Degenerate PCR (Touchdown PCR)	23
3.4.2.6. Gel extraction	23
3.4.2.7. Ligation and transformation	25
3.4.2.8. PCR for confirm insert.....	26
3.4.2.9. Plasmid purification.....	27
3.4.2.10. Analysis product sequencing.....	29
3.4.2.11. Amplification of fragmen homolog NRT2.1 gene on 15 cultivars of shallot	29
3.4.2.12. TAIL PCR	29
3.4.2.13. Gel extraction	30
3.4.2.14. Re-amplification and sequencing	31
3.5. Research Flow	32
IV. RESULTS AND DISCUSSION	33
4.1. Identification of nitrate transporter gene on shallot used chlorate toxicity treatment	33
4.1.1. Shallot (<i>Allium cepa</i> L. Aggregatum group)	34
4.1.2. Control plant or corn (<i>Zea mays</i> L.).....	38
4.2. Molecular identification of homolog NRT2.1 gene on shallot.....	43
4.2.1. Fragment homolog NRT2.1 gene on shallot.....	43
4.2.2. Homolog NRT2.1 gene on 15 cultivars of shallot	49
4.2.3. TAIL-PCR	51
V. CONCLUSIONS AND SUGGESTION.....	57



UNIVERSITAS
GADJAH MADA

IDENTIFICATION OF HOMOLOG NRT2.1 GENE ON SHALLOT (*Allium cepa* L. *Aggregatum* group)
DINIHARI INDAH K, Prof. Dr. Ir. Siti Subandiyah, M.Agr.Sc. ; Dr. Stephen Harper
Universitas Gadjah Mada, 2015 | Diunduh dari <http://etd.repository.ugm.ac.id/>

5.1. Conclusions	57
5.2. Suggestion	57
REFERENCES	58
APPENDICES	62