

TABLE OF CONTENTS

PROMOTERS i

ZUSAMMENFASSUNG v

ABSTRACT vi

TABLE OF CONTENTS vii

LIST OF ABBREVIATION ix

LIST OF FIGURES xi

LIST OF TABLES xiii

OUTLINE OF THE DISSERTATION xiv

INTRODUCTION 1

 Viruses in forests and public green spaces 1

 The world of emaraviruses 4

CHAPTER I The complex world of emaraviruses – challenges, insights and prospects 9

 Abstract 9

 1. Introduction 9

 2. Symptomatology 11

 3. Transmission and Host Range 21

 4. Geographic occurrence 23

 5. The four main phylogenetic clades of emaraviruses 26

 6. Genome organization and genetic diversity 26

 7. A proposal: dividing the current genus emaravirus into at least two genera 38

 8. Established and putative members of the genus 39

 9. Diagnosis and control strategies 44

 10. Research requirements for emaraviruses 48

 References 49

CHAPTER II Identification of an emaravirus in a Common oak (*Quercus robur* L.)
conservation seed orchard in Germany: implications for oak health 57

 Abstract 57

 Introduction 57

 Materials and Methods 59

 Results 61

 Discussion 66

 Conclusions 69

 References 69

CHAPTER III A novel emaravirus comprising five RNA segments is associated with the
ringspot disease in oak 72

 Abstract 72

Main Text.....	72
Appendix A3.....	75
References	78
CHAPTER IV Detection of viruses in special stands of common ash reveals insights into the virome of <i>Fraxinus excelsior</i>	79
Abstract	79
1. Introduction	79
2. Materials and Methods	82
3. Results	83
4. Discussion	91
5. Conclusions	93
Appendix A4.....	93
References	97
CHAPTER V Use of generic primer sets for the detection of emaraviruses in woody hosts and development of a serological ELISA for common oak ringspot-associated virus (CORaV) and ash shoestring-associated virus (ASaV) detection.....	99
Introduction	99
Material and Methods.....	100
Results	106
Discussion	114
Appendix A5.....	115
References	118
CHAPTER VI Investigations on vector candidates of the common oak ringspot-associated virus (CORaV)	120
Introduction	120
Material and Methods.....	120
Results	121
Discussion	123
Appendix A6.....	124
References	125
GENERAL DISCUSSION	127
The virome of forest trees	127
(Emara)viruses and plant health	131
Future directions.....	132
TAKE HOME MESSAGES	135
BIBLIOGRAPHY FOR INTRODUCTION AND DISCUSSION.....	136
Eidesstattliche Erklärung.....	- 145 -