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Metabolomic changes of *Brassica rapa* under biotic stress

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**Metabolomic changes of *Brassica rapa* under
biotic stress**

Ibrahim Bayoumi Abdel-Farid Ali

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Dr. P. Klinkhamer

During my study in the Netherlands and Egypt, some people passed away, I dedicate this book to them:

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List of Abbreviations

| | |
|------------|--|
| AS | anthranilate synthase |
| BDPs | breakdown products |
| CM | chorismate mutase |
| COSY | correlated spectroscopy |
| DW | dry weight |
| EST | expressed sequence tag |
| GABA | γ -amino butyric acid |
| GC | gas chromatography |
| GFP | green fluorescent protein |
| HMBC | heteronuclear multiple bond correlation |
| HMQC | heteronuclear multiple-quantum coherence |
| HPLC | high performance liquid chromatography |
| HR | hypersensitive response |
| IAA | indole-3-acetic acid |
| ICS | isochorismate synthase |
| HST | host specific toxin |
| INA | isonicotonic acid |
| ISR | induced systemic resistance |
| ITCs | isothiocyanates |
| JA | jasmonic acid |
| LIPO | lipoxygenase |
| MIC | minimum inhibition concentration |
| MJ | methyl jasmonate |
| MS | mass spectrometry |
| NMR | nuclear magnetic resonance spectroscopy |
| <i>Pad</i> | phytoalexin deficit mutant |
| PAL | phenylalanine ammonia-lyase |
| PCA | principal component analysis |
| PCD | programmed cell death (apoptosis) |
| PG | polygalacturonase |
| PLA | phospholipase |
| PLS-DA | partial least square-discriminant analysis |
| PR | pathogenesis related proteins |
| ROS | reactive oxygen species |
| PCR | polymerase chain reaction |
| SA | salicylic acid |
| SAR | systemic acquired resistance |
| SSH | suppression subtractive hybridization |
| T-GSL | total glucosinolates |
| TMSP | trimethylsilyl propionic acid Na salt |
| UV | ultra violet |

