

Index

List of Abbreviations.....	8
Resumen.....	11
Abstract.....	12
Resum.....	13
Chapter 1: General Introduction.....	17
1.1. Economic importance of melon.....	17
1.2. Origin and taxonomy of melon.....	18
1.3. Groups Flexuosus and Ibericus.....	21
1.4. Grafting.....	23
1.5. Salinity.....	28
1.6. Fruit Quality and the effect of grafting.....	29
1.6.1. External fruit characteristics.....	30
1.6.2. Internal fruit characteristics.....	30
1.6.3. Biochemical composition.....	31
1.6.4. Shelf life.....	32
1.6.5. Effect of Grafting and Salinity on external fruit characteristics.....	33
1.6.6. Effect of Grafting and Salinity on internal fruit characteristics.....	34
1.6.7. Effect of Grafting and Salinity on affecting Biochemical composition.....	36
1.6.8. Effect of Grafting and Salinity on Shelf Life.....	37
1.7. Organic Farming.....	38
1.8. Doctoral Thesis Structure.....	43
1.9. General Objective.....	48
1.9.1. Specific Objectives.....	48
Chapter 2. Spanish Melon Landraces: Revealing Useful Diversity by Genomic, Morphological, and Metabolomic Analysis.....	52
2.1. Abstract.....	53
2.2. Introduction.....	54
2.3. Results.....	56
2.3.1. GBS results.....	56
2.3.2. Population Structure Analysis.....	57
2.3.3. Linkage Disequilibrium Decay.....	59
2.3.4. Phylogeny.....	60
2.3.5. Fruit Characterization.....	61
2.3.6. Sugars and Acids Content.....	64

2.3.7.	Volatile Organic Compounds (VOCs) Content.....	66
2.4.	Discussion	72
2.5.	Materials and Methods	80
2.5.1.	Plant Material	80
2.5.2.	Experimental Design	81
2.5.3.	DNA Extraction and Genotyping-by-Sequencing Libraries	81
2.5.4.	SNP Calling and Analysis	81
2.5.5.	Population Structure	82
2.5.6.	Phylogenetic Relationship.....	82
2.5.7.	Linkage Disequilibrium Decay	82
2.5.8.	Melon Characterization	83
2.5.9.	Metabolomic Analysis.....	83
2.5.10.	Volatile Organic Compound Analysis	84
2.5.11.	Statistical Analysis	85
Chapter 3. Grafting Snake Melon [<i>Cucumis melo</i> L. subsp. <i>melo</i> var. <i>flexuosus</i> (L.) Naudin] in Organic Farming: Effects on Agronomic Performance; Resistance to Pathogens; Sugar, Acid, and VOC Profiles; and Consumer Acceptance		90
3.1.	Abstract	91
3.2.	Introduction	92
3.3.	Materials and Methods	95
3.3.1.	Fields Characteristics	95
3.3.2.	Plant Material	95
3.3.3.	Crop Management	96
3.3.4.	Soil and Water Conductivity	97
3.3.5.	Pathogen Detection	97
3.3.6.	Pathogenicity Tests Against Fungal Pathogens.....	98
3.3.7.	Fruit Characterization.....	100
3.3.8.	Fruit Sensorial and Metabolomics Analysis.....	100
3.3.9.	Sugar and Acid Analysis	101
3.3.10.	Analysis of Volatile Compounds	102
3.3.11.	Statistical Analysis	103
3.4.	Results	104
3.4.1.	Growth-Limiting Factors.....	104
3.4.1.1.	Climate, Water, and Soil Properties	104
3.4.1.2.	Pests and Diseases.....	104
3.4.2.	Response of Snake Melon to <i>M. phaseolina</i> , <i>M. cannonballus</i> , and <i>Neocosmospora</i> spp.	106
3.4.3.	Yield and Fruit Characteristics.....	108

3.4.4.	Sensorial Evaluation.....	113
3.4.5.	Accumulation of Sugars, Acids, and Volatiles.....	115
3.5.	Discussion	122
3.6.	Conclusion.....	127
Chapter 4. Evaluating grafted Ibericus Traditional melons under Organic Farming Conditions: effect on agronomic performance and fruit traits		133
4.1.	Abstract	134
4.2.	Introduction	135
4.3.	Materials and Methods	138
4.3.1.	Study Location	138
4.3.2.	Plant cycle	139
4.3.3.	Pest and Pathogen detection	140
4.3.4.	Fruit Characterization.....	140
4.3.5.	Statistical analysis	141
4.4.	Results	141
4.4.1.	Climatic, water and soil results	141
4.4.2.	Pests and Diseases	142
4.4.3.	Yields and Fruit Characterization.....	148
4.5.	Discussion	157
Chapter 5. Sustainable cultivation of melon landraces: effects of grafting on the accumulation of flavour-related compounds.....		164
5.1.	Abstract	165
5.2.	Introduction	166
5.3.	Materials and Methods	168
5.3.1.	Plant Materials	168
5.3.2.	Experimental design and cultivation	168
5.3.3.	Analysis of sugars and acids	169
5.3.4.	Analysis of Volatile Compounds	170
5.3.5.	Statistical analysis	171
5.4.	Results	171
5.5.	Discussion	180
5.6.	Conclusion.....	185
6.	General Discussion.....	189
7.	Conclusions	201
	Annex	204
	Bibliography.....	245