

CONTENTS

SECTION I: AGING, MATURATION AND REJUVENATION

Aging of Meristems and Morphogenetic Potentialities.....	3
V.S. Trippi	
Maturation and Senescence: Types of Aging.....	11
V.S. Trippi	
Adult vs. Juvenile Explants: Directed Totipotency.....	19
D.J. Durzan	
Recovery of Transient Juvenile Capacities During Micropropagation of Filbert.....	27
C. Díaz-Sala, M. Rey and R. Rodríguez	
Juvenility and Maturity of Woody Species in New Zealand.....	37
J.L. Oliphant	
Development of Rejuvenation Methods for "in vitro" Establishment, Multiplication and Rooting of Mature Trees.....	43
A. Ballester, M.C. Sánchez, F.C. San-José, F.J. Vieitez and A.M. Vieitez	
Aging in Tree Species: Present Knowledge.....	51
A. Meier-Dinkel and J. Kleinschmit	

SECTION II: VEGETATIVE PROPAGATION: ADVANTAGES AND LIMITATIONS

Special Problems and Prospects in the Propagation of Woody Species.....	67
T.A. Thorpe and I.S. Harry	
Factors Affecting Tissue Culture Success in Mass Propagation.....	75
P.L. Pasqualetto	
Effective Handling of Plant Tissue Culture.....	81
R. Sánchez Tamés, B. Fernández Muñoz and J.P. Majada	

"In vitro" Micromultiplication of Grapevine: Effect of Age, Genotype and Culture Conditions on Induction of Callus in Vitis spp. Leaf Segments.....	89
K.A. Roubelakis-Angelakis and K. Katsirdakis	
Plant Cells and Protoplast Immobilization as Tools for Studies on Cell Function, Metabolism and Differentiation.....	97
M.S. Pais and J.M.S. Cabral	
Recovery of Somatic Variation in Resistance of Populus to Septoria Musiva.....	113
M.E. Ostry, D.D. Skilling, O.Y. Lee-Stadelmann W.P. Hackett	
Shoot-Tip Grafting "in vitro" of Woody Species and its Influence on Plant Age.....	117
L. Navarro	
The Control by Cryopreservation of Age-Related Changes in Plant Tissue Culture.....	125
E. Benson and K. Harding	
Vitrification in Plant Tissue Culture.....	133
P.L. Pasqualetto	

SECTION III:

ULTRASTRUCTURAL, GENETIC AND BIOCHEMICAL CHARACTERISTIC OF AGING AND SENESCENCE

The Molecular Genetics of Maturation in Eastern Larch (<i>Larix laricina</i> (Du Roi) K. Koch).....	141
K. Hutchison, M. Greenwood, C. Sherman, J. Rebbeck and P. Singer	
Cellular, Biochemical and Molecular Characteristics Related to Maturation and Rejuvenation in Woody Species.....	147
W.P. Hackett, J.R. Murray, H.H. Woo, R.E. Stapfer and R. Geneve	
Uptake Characteristics of Sugars and Amino Acids by <i>Vitis vinifera</i> L. Protoplasts.....	153
K.A. Roubelakis-Angelakis and P.A. Theodoropoulos	
Improvement of Micropropagation Methods Linked to Biochemical Properties During "in vitro" Cultures.....	161
A.M. Hirsch and D. Fortune	
Age Dependence of Different Components of Variance.....	169
M. Huehn and J. Kleinschmit	
Interactions Between Genotype and Developmental Factors Modifying Peroxidase Expression.....	183
A.M. Hirsch	

Organogenesis: Structural, Physiological and Biochemical Aspects.....	191
T.A. Thorpe	
Changes in Carbohydrate Metabolism During Transient Senescence of Mustard (<i>Sinapsis alba</i> L.) Cotyledons.....	199
H.I. Kasemir	
Study of Gene Expression During "in vitro" Culture of Tobacco Thin Cell Layers by Two-Dimensional Electrophoresis of Proteins.....	207
K. Tran Thanh Van, M. Zivy, A. Cousson and H. Thiellement	
An Experimental Model for the Analysis of Plant Cell Differentiation: Thin Cell Layer Concept, Strategy, Methods, Records and Potential.....	215
K. Tran Thanh Van, L. Richard and G.A. Cyrille	
Nutrient Remobilization, Nitrogen Metabolism and Chloroplast Gene Expression in Senescent Leaves.....	225
B. Sabater, A. Vera, R. Tomás and M. Martín	
Oxidative Stress and Senescence in Oat Leaves.....	231
V.S. Trippi	
Structure and Function of Glutamate Dehydrogenase During Transient Senescence of Mustard (<i>Sinapsis alba</i> L.) Cotyledons.....	239
W. Lettgen, L. Britsch and H.I. Kasemir	

SECTION IV: MODULATION OF AGING AND MADURATION

Effects of Vascular Tissue Containing a Meristem of Adjacent Pith: Hormone-Like Factors.....	249
J. Lustinec	
Hormonal Control of Senescence.....	257
B. Sabater, M. Martín, F.J. Sánchez and A. Vera	
Modulation, Purification and Function of a Soluble Auxin Receptor.....	263
P.C.G. Van der Linde and A.M. Mennes	
Free Radicals in Stressed and Aging Plant Tissue Cultures.....	269
E. Benson	
Polyamines and Aging: Effect of Polyamine Biosynthetic Inhibitors on Plant Regeneration in Maize Callus Cultured "in vitro".....	277
A.F. Tiburcio, X. Figueras, I. Claparols, M. Santos and J.M. Torné	

Hormone Action and Sensitivity: Possible Relation to Aging.....	285
P.C.G. Van der Linde	

SECTION V: GENETIC MANIPULATION

Cellular and Morphogenic Reorientation Induced by Inserting Foreign DNA.....	295
A. Boronati	
Genetic Manipulation of Forest Trees: Implications for Physiological Processes.....	303
D.J. Durzan	
Biotechnology in Forest Tree Improvement: Trees of the Future.....	311
V. Chalupa	
Biotechnology in Forest Tree Improvement: Trees of the Future.....	319
J. Kleinschmidt and A. Meier-Dinkel	

SELECTED POSTERS

Micropropagation of <i>Vitis vinifera</i> from "Vinho Verde" Region of Portugal: A Method for Grapevine Leafroll Virus Elimination.....	327
M. Casal, and M.S. Pais	
"In vitro" Culture of <i>Pistacia vera</i> L. Embryos and Aged Trees Explants.....	335
A. González and D. Frutos	
Tissues Culture and Regeneration in Jojoba.....	339
S. Unique	
Effect of Cold Temperature on Shoot Regeneration "in vitro" From Aged Cultures of GF-677 (<i>Prunus persica</i> x <i>Prunus amygdalus</i>).....	345
K. Dimasi-Theriot and A. Economou	
Age and Meristem "in vitro" Culture Behaviour in Filbert.....	351
M ^a .T. Fernández, M. Rey, C. Díaz-Sala and R. Rodríguez	
Influence of Explant Source on "in vitro" Axillary Shoot Formation in Oak (<i>Quercus robur</i> L.) Seedlings.....	357
H. Volkaert	
Segmentation Effect of Immature Spike on Triticale Calli Induction.....	361
H. Guedes-Pinto, O. Pinto-Carnide and F. Leal	
Cuticle Development in <i>Dianthus caryophyllus</i> Plantlets.....	367
M.A. Fal, P. Bernad, R. Obeso and R. Sánchez Tamés	

Partial "Rejuvenation" of 20-Year-Old Sitka Spruce by Lower Crown Pruning.....	373
C. Selby, R. Lee and B.M.R. Harvey	
Phase Change in <u>Sequoiadendron giganteum</u>	377
O. Monteuiis and M.C. Bon	
Rejuvenation of Adult Specimens of <u>Castanea sativa</u> Mill: Through "in vitro" Micropropagation.....	383
J.A. Feijó and M.S. Pais	
Embryogenic Cultures of Tobacco Pollen as a Model System To Study Plant Rejuvenation.....	389
O. Vicente, D. Garrido, N. Eller, R.M. Benito Moreno, A. Alwen and E. Heberle-Bors	
The Meristematic Calli of Maize: A Maintenance System of Tissue Juvenility.....	395
J.M. Torné and M.A. Santos	
Growth and Development "in vitro" Long Term Cultures.....	399
R.W. Joy IV and T.A. Thorpe	
Protein Patterns on <u>Corylus avellana</u> L. Rooting Capacity.....	405
A. González, R.S. Tamés and R. Rodríguez	
Inducing Artificial Tetraploids from Diploid Meadow Fescue (<u>Festuca pratensis</u> Huds.) Varieties and the Investigation of Some Meiotic Characteristics of Them.....	411
B. Deniz	
Inactivation of Peroxidase. Its Role in Plant Senescence.....	417
M. Acosta, M.B. Arnao, J.A. del Río, J.L. Casas J. Sánchez-Bravo and F. García-Cánovas	
Electron Microscope Observations and BA Effects in Apple Cells.....	423
R.J. Ordás, B. Fernández and R. Rodríguez	
Polyamine and Ethylene Metabolisms During Tomato Fruit Ripening.....	429
M. Acosta, J.L. Casas, J.A. del Río, M.B. Arnao A. Ortuño and F. Sabater	
Levels of Cytokinins in Aging and Rejuvenated <u>Corylus avellana</u> L. Tissues.....	435
B. Fernández, R. Rodríguez, M.J. Cañal, H. Andrés and A. Rodríguez	
Changes in Polyamines Related With Pruning As a Method for Rejuvenation in Filbert.....	439
M. Rey, R. Astorga, C. Díaz-Sala, A.F. Tiburcio and R. Rodríguez	
Early Flowering in Seedlings of Asparagus Promoted by Diuron and Atrazine.....	445
M.L. González Castañón	
Index.....	449